Railway Age

Vol. 79, No. 7 August 15, 1925

Table of Contents Appears on Page 5 of Advertising Section

Taxes Still Increase

WHETHER railway traffic declines or increases, whether rates are reduced or advanced, whether service deteriorates or is improved, there is one thing that always increases and that is railway taxes. They were $8,400,000 greater in the year 1924 than in 1923, and in the first five months of 1925 they were $6,565,000 greater than in the first five months of 1924. The increase was from slightly over $133,000,000 in the first five months of 1924 to more than $139,600,000 in the first five months of 1925. This was an advance of 5 per cent, and if it continues at this rate throughout the year the total taxes of the railways will exceed $361,000,000, which will make them almost double what they were in 1917 and much more than double what they were in 1916. The increase is going on throughout the country. Even in the western district, where the net return the railways have been earning has been so inadequate that they have finally asked for an advance in rates, taxes were $3,500,000 greater in 1924 than in 1923 and in the first five months of this year were almost $1,000,000 more than in the corresponding months of last year. The increases are entirely due to the policy of state and local authorities who are supposed to be directly under the control of state and local people. The western roads alone will this year pay at least $85,000,000 more taxes than they did ten years ago, an amount equal to a five per cent advance in their freight rates. The public officials who are foremost in causing these increases in taxes are also always at the front opposing the charging of the rates necessary to enable the railways to pay them.

The Problem of Suburban Traffic

THE tempest over the increase in commutation rates in the New York zone by the New York, New Haven & Hartford still rages, although there have at this writing been no new official developments. The road has agreed to issue receipts for the increase in rates pending action of an application to the New York Public Service Commission for a rehearing. Meantime another road has been forced to deny twice rumors that it is contemplating asking for an increase in commutation rates. Certain individuals, it would appear, are endeavoring to keep up the hubbub as a means for remaining in the limelight as champions of the cause of "the people." In most communities of this continent where suburban passenger service performs an important local transportation function, the service is provided by a number of railroads. And, at least in one or two important instances, there are considerable differences, not only between communities but between railroads in the same community, in the rates they charge and the character of service they give. Some have made heavy investments in the service; others considerably less. Yet there does not seem to be any definite correlation between the character of service provided and the rates charged, nor any concerted action to put the business on a well-defined, sound economic basis. From the railroad point of view the problem of suburban traffic is becoming more and more important. Commuters now total almost 50 per cent of all passengers carried. The attitude which the roads will adopt if the traffic continues to grow and tends more and more to overcrowd their facilities may have the greatest effect on future city planning and the well-being of our great centers of population. It is not unlikely that railroad statesmanship of a high order may be needed before a great while to bring the problem to a successful and satisfactory solution.

Considering Co-operation Selfishly

IN the *Railway Age* of May 16 we published an editorial note entitled "Co-operation Selfishly Considered" in which we quoted from a letter received from a trainman who advocated co-operation between railroad employees and management in facing competition. He told of the pronounced slowing down in promotion in train service which has resulted from the competition of highway vehicles and advocated the co-operation of employees with the managements in facing a common enemy. The proposal brought forth editorial comment from several sources, including the Railroad Trainman, the official organ of the trainmen's brotherhood. This journal in the main agrees with our position that it is to the interest of railroad employees to co-operate with the management in such a case and then goes on to cite instances of just how serious the problem is from the employees' point of view. In one section where railroad service has been seriously curtailed, as a result of bus competition, men of 12 years' service are now on the extra board and are finding little to do. The Railroad Trainman points out that the trainmen's organization has gone on record as favoring greater regulation for common carriers on the highways and in general has done what it could to co-operate in the manner suggested in our editorial. This attitude is fortunate and it ought to enjoy wide emulation. At the same time, however, something more than an official attitude as shown by resolutions is necessary. The action of the Brotherhood of Locomotive Engineers in entering the lists actively in the interests of the railroad industry, as noted in the *Railway Age* last week, points the way in which such union co-operation can be made really effective.

The Railroad Labor Institute

LAST week, as was noted in the *Railway Age* of August 8, a number of railroad labor union officers met at Brookwood Labor College, Katonah, N. Y., to attend a "railroad institute" arranged for by that institution. The purpose of the institute was educational—not primarily along lines of bargaining for more favora-

ble hours and working conditions, nor yet to propagate idealistic social theories faintly tinged with red; but rather with the purpose of sketching the history of railroads, the part they play in life on this continent and the function which railway employees have in their successful operation. This institute was only a beginning and a rather modest one; others are planned for the future, and the idea seems to be one of so much intrinsic merit from the union standpoint that it is not unlikely that we have here the beginning of what may some day become a very important movement. The labor union in this country which can maintain a position of importance in our economic life solely by its nuisance value would appear to be on the decline. The public is coming to feel that if it must tolerate the conditions which unions seek to impose, it must at the same time be assured of something constructive in return. The old union idea that its sole purpose is the protection of the immediate interests of its members in the way of hours, wages and working conditions and that it has no responsibility in the efficiency of industry dies hard, however. The idea of the labor institute seems to have originated with some of the more progressive minds in the labor movement who realize the necessity of education for a wider viewpoint on the part of labor union leaders and the rank-and-file which they represent. The *Railway Age* has no delusions about this labor institute or any that may follow it. It is a labor union activity and will possibly develop some points of view contrary to our conception of the best interests of the railroad industry as a whole. Yet it must, nevertheless, be welcome, insofar as it promises to widen the horizon of labor union policy and to cause the leaders to see that their own best interests often lie in other directions than simple bargaining for improved wages and working conditions.

Some Questions About the Potter Plan

THE plan supported by the receivers of the Chicago, Milwaukee & St. Paul for an advance of 5 per cent in freight rates in western territory and for dividing between the railways on a new basis the additional revenue secured has become known as the "Potter plan" because it is understood to have originated with Mark W. Potter, now one of the receivers of the St. Paul, and formerly a member of the Interstate Commerce Commission.

There is need for several reasons of full and frank discussion of this plan. It derives prestige from the fact that Mr. Potter is a man of ability who has been a railway president as well as a member of the commission, and because it is backed by a railway executive of such long experience and recognized ability as H. E. Byram, formerly president and now one of the receivers of the St. Paul. It also derives prestige from the fact that it is understood it will be supported before the commission by Charles E. Hughes. The plan is important because, if adopted, it would dispose of a relatively large part of the net operating income of the western railways. The net operating income of these roads in 1924 was $378,000,000. It is reasonable to assume that an advance of 5 per cent in freight rates would increase this to approximately $460,000,000. The $82,000,000 of net operating income pooled and distributed under the Potter plan would therefore be 21 per cent as much as the net earned by the western roads in 1924, and about 18 per cent of the net they probably would earn after rates were advanced.

The scope of the original plan has been broadened by a suggestion Mr. Potter has made in a recent pamphlet that rates might be advanced throughout the country, instead of merely in western territory, and the entire increase in revenues divided in accordance with his plan, which is, briefly, that the increased earnings shall be prorated among the individual roads in proportion to the extent to which they have failed to earn 5¾ per cent.

The *Railway Age* is unable to agree with the proponents of this plan that it would merely tend to give effect to the letter and spirit of the Transportation Act. We believe that, whether it is sound or unsound, its adoption would revolutionize the methods and policy of regulation provided in the Transportation Act. That act contemplates, first, that the railways of each group shall be allowed and enabled to earn a fair return on the aggregate value of their property, which the Interstate Commerce Commission has held would be 5¾ per cent annually; and, secondly, that each railway shall be allowed to keep all its earnings up to 6 per cent and half of what it earns above 6 per cent. The Potter plan contemplates, first, that the railways of western territory shall, temporarily at least, voluntarily forego their claim to earn an average of 5¾ per cent; and, secondly, that many individual lines shall give up part of their net operating income even when they are earning less than 5¾ per cent.

The legal phases of the plan will be discussed before the commission and, perhaps, before the courts, by eminent lawyers. There are, however, certain practical questions regarding it which must be cleared up before its legal phases can be intelligently considered. As we understand the matter it is definitely proposed to base the allocation of the additional net operating income it is hoped to secure upon the net operating income earned by the various railways on their property investment in the year 1924. The question at once arises as to why the allocation should be based upon the financial results secured by the several roads in 1924. It would make a great deal of difference to many railway systems whether the allocation was based on results in 1924 or some other year. For example, in 1923, the Missouri Pacific earned only $8,893,000 net operating income, while in 1924 it earned $15,818,000. Likewise, in 1923 the Missouri-Kansas-Texas Lines earned only $8,810,000 net operating income, while in 1924 they earned $12,587,000. Would the proposed pool be permanent, and the allocation be based permanently on the results of 1924? If so, roads like the Missouri Pacific and Missouri-Kansas-Texas, which had large increases in their net in 1924, would be permanently deprived of large amounts they would have derived from an allocation based on the results of 1923, for example.

Other examples of the opposite kind may be cited. The Pacific System of the Southern Pacific in 1923 earned a net operating income of $45,860,000 and in 1924 only $38,594,000. The Minneapolis, St. Paul & Sault Ste. Marie in 1923 earned $8,204,000 and in 1924 only $6,776,000. The Chicago & Alton in 1923 earned $5,320,000 and in 1924 only $4,395,000. The Duluth & Iron Range in 1923 earned $1,758,000 net and in 1924 less than $273,000. Are these roads to be permanently given much larger allotments from the pool than they otherwise would receive because their net operating income declined in 1924?

Mr. Potter suggests that the advance in rates and the pool might be extended to include railways in other territories. The Lehigh Valley in 1923 earned only $6,573,000 net operating income and in 1924 $11,392,000. The Boston & Maine in 1923 earned less than $3,000,000 net, and in 1924 almost $9,000,000. What these roads would think of an allocation based on the results of 1924 is obvious.

The foregoing figures show that allotments from a pool

based permanently or for a long period upon the net results of a single year would be highly unsatisfactory and inequitable. Some roads would gain greatly and others lose greatly no matter what year was chosen. It is difficult to believe that a plan that would produce such results would be held legal.

It may be said that the allotment of the pooled revenue might be based on the average financial results of the individual roads over a period of years. This probably would make the plan work less inequitably, but it is doubtful if it would make it work equitably. One road might for three years the results of which were taken as a basis earn so large a return that it would be entitled to nothing from the pool, and then during the next three years earn so small a return that the earnings it had to give up would do it great injustice. Another road might during the three years taken as a basis earn a small net return that would entitle it to a large amount from the pool, and then while the pool was in operation earn such a large net return that it would seem unjust for other roads to be required to let it have part of their earnings. There is no certainty of stability in the net operating income of individual railways, and therefore no certainty that earnings pooled as proposed would go to individual roads in proportion to their needs.

It may be suggested that the money derived from the advance in rates should be pooled and divided in each year in proportion to the extent to which each railway failed in the preceding year to earn 5¾ per cent. This, however, would have a direct tendency to cause railways to increase their maintenance expenses and thereby increase the amount they would get from the pool. We say, not that it would cause this to be done, but that it would have a *tendency* to cause it to be done. If it had any effect on economy and efficiency of management its tendency would be to reduce them. Any plan of which this is true should be carefully scrutinized.

The plan contemplates that the pooled earnings shall be distributed among the roads in proportion to the extent to which they have failed to earn 5¾ per cent on their property investment until the valuations of the individual railways have been completed. This undoubtedly means that the property investment would be used as a basis for some years.

The *Railway Age* always has believed that the final valuations of the various groups of railways, and of the railways as a whole, would exceed their aggregate property investments. When, however, it is proposed to use the property investment accounts of individual railways as a basis for determining the way part of their earnings should be divided the question at once arises as to whether equal credit should be given to the investment account of each company. Anybody who is familiar with the history of the financing and developing of the various railways, and who has compared their property investment account, is unlikely to say that their investment accounts are all equally worthy of credit. The property investment reported by the railways in western territory averages about $66,000 per mile. There are, however, roads in the territory without any more than the average density of traffic, and which undoubtedly did not actually cost any more than the average per mile of all, which report property investment accounts largely in excess of $100,000 a mile.

Would it be reasonable, in view of such facts, to divide a large part of the aggregate net operating income between the roads on the basis of their property investment accounts?

These and many other practical questions regarding the way the proposed plan would operate must be answered before its merits and demerits can be fully understood.

Concerning Railway Wages

IN its issue for August the "Railroad Trainman," the official publication of the Brotherhood of Railroad Trainmen, charges the *Railway Age* with "studied misrepresentation" of the wages of railway employees. The *Railway Age* has respected the fairness and intelligence with which the "Railroad Trainman" usually has been edited, but even Homer is said to have nodded occasionally. In this instance the "Railroad Trainman," in trying to support its charge of "misrepresentation" against the *Railway Age*, has disclosed an astounding ignorance regarding railway wages. In our innocence we had supposed that labor leaders and the editors of labor union papers knew all about such things.

The *Railway Age* published an editorial in its issue for April 25 entitled "Rates Decline—Wages Advance," which drew the criticism from the "Railroad Trainman." In that editorial the following statements were made: "While the trend of rates is downward, the trend of wages is upward. In January, 1923, the average compensation of employees paid on a daily basis (not including overtime) was $7.52 a day; in January, 1924, $7.62; and in January, 1925, $7.71. In January, 1923, the average compensation of employees working on an hourly basis (not including overtime) was 56 cents, in January, 1924, 58 cents; and in January, 1925, 59 cents." Commenting upon these statements the "Railroad Trainman" says: "Eight hours at an average hourly rate of 59 cents does not reach $7.71. It is $2.99 shy." These statements are quite true; but they show the "Railroad Trainman" completely confuses the average *daily* wage of employees paid on a *daily* basis with the earnings of employees paid on an *hourly* basis. Apparently it is wholly unfamiliar with the method formulated by the Railroad Labor Board and adopted some years ago by the Interstate Commerce Commission for reporting railway wage statistics.

Under this method the commission issues each month a report which shows separately the wages of employees paid on a *daily* basis and of employees paid on an *hourly* basis. The January report of the commission showed that in that month the Class I railways had 122,700 employees who were paid on a daily basis and 1,605,626 who were paid on an hourly basis. The average daily wage of $7.71 of those paid on a daily basis was not arrived at, as the "Railroad Trainman" assumes, by a computation based by us on the average hourly wages of hourly employees, *because those paid on a daily basis and those paid on an hourly basis are entirely different employees.* The figures given by us for both daily and hourly wages were merely copied correctly from the commission's report, neither being the result of any computation made by us, but both being computed by the commission itself.

Again, the "Railroad Trainman" calls attention to the fact that the *Railway Age* later stated that the average monthly pay of train and engine service employees in February, 1925, was $181. It adds: "This month had 28 railroad working days which made an average daily rate of $6.46 which, with overtime computed along with the hourly rate, brings the wage figures much closer to the actual wages paid than the January, 1925, daily average of $7.71, which, regardless of the figures or their source, are impossible." Here the "Railroad Trainman" again completely confuses statistics regarding the compensation of employees paid on a daily basis with those regarding employees paid on an hourly basis. The monthly wage statistics of the commission show plainly what employees work on a daily basis and what on an hourly basis, and also that all employees in train and engine service work on an hourly basis. The figure of $181 was that given

by the commission as being the average earnings, including overtime, of train and engine service employees in February, their straight time earnings having been $178.

The "Railroad Trainman" says that the question with it is "who is receiving the exceptionally high rate that goes to make up the average rate of $7.71 for a regular day in January, 1925." We will gladly give the "Railroad Trainman" this information, although it could easily get it from the wage reports of the commission. The classes and numbers of employees who were paid on a daily basis in January were as follows: Executives, general officers and assistants, 7,314; division officers, assistants and staff assistants, 9,117; professional, clerical and general, including chief clerks of major departments, 15,625; chief clerks of minor departments and assistant chief clerks and supervisory cashiers, 13,115; traveling auditors or accountants, 2,077; messengers and office boys, 6,512; lieutenants and sergeants of police, 2,407; supervising traffic agents, 1,615; traffic agents, advertising and development agents, 6,209; fire-prevention, smoke and time service inspectors and office building inspectors, 404; claim agents and claim investigators, 1,840; roadmasters and general foremen (M. of W. & S.), 3,304; assistant general foremen (M. of W. & S.), 324; general foreman and supervising inspectors (signal, telegraph and electrical transmission), 497; general foreman, assistant general foreman (M. E. and stores), and equipment, shop and electrical inspectors (M. E.), 15,430; material and supplies inspectors, 1,749; station agents, 2,498; station masters and assistants, 508; supervising baggage agents, 123; transportation and dining service inspectors, 949; crossing and bridge flagmen and gatemen, 22,783; yardmasters and assistants, 6,831.

The foregoing list includes many different classes of employees, and the average of $7.71 a day for them may be criticized as being made high by the inclusion of the salaries of many officers and foremen. There are, however, classes of employees paid on an *hourly* basis whose average earnings per day exceed the average of $7.71 received in January by those paid on a daily basis. For example, in January for eight hours worked by them the earnings (including overtime) of road passenger conductors were $9.58; of road passenger engineers, $11.46; of road freight engineers, $9.07; of road freight conductors, $7.67 and of all employees in train service, $7.22.

The "Railroad Trainman" says: "If we really desire better understanding let us not get mired in the swamp of studied misrepresentation. Let us put the whole darn business on the table where the public can understand what we are talking about." These are sound sentiments. We fully agree with them. However, before we can "put the whole darn business on the table where the public can understand what we are talking about," it will be best for ourselves to know what we are talking about. The "Railroad Trainman" in this editorial showed that it did not know what it was talking about—that it had never examined the official statistics regarding railway wages and did not know even the difference between wages paid to employees who are paid on a daily basis and on an hourly basis; and that without looking them up, it yet had the presumption to criticize our statements regarding them. We strongly recommend that it make itself more familiar with the facts regarding railway wages before again, in its ignorance, it charges those who state them correctly with misrepresentation.

Average Earnings Per Day of Employees Reported on a Daily Basis.

Month	1925	1924	1923
January	$7.71	$7.62	$7.52
February	8.58	8.17	8.34
March	7.73	7.64	7.35
April	7.84	7.76	7.77
May	7.86	7.64	7.50

Average Earnings Per Hour of Employees Reported on an Hourly Basis.

Month	1925	1924	1923
January	$.588	$.576	$.562
February	.598	.585	.571
March	.598	.578	.559
April	.582	.574	.562
May	.582	.572	.560

The editorial in the *Railway Age* of April 25 which the "Railroad Trainman" criticized called attention to the fact that the trend of railway wages was steadily upward. The latest wage statistics available when that editorial was written were those for January. Statistics for the first five months of this year are now available and they emphasize this upward trend. In the accompanying table we give the average earnings per day and the average earnings per hour (not including overtime) of employees in the first five months of 1923, 1924 and 1925. The average earnings per day and per hour reported vary from month to month according to the number of days in a month and to operating and traffic conditions. It will be noted, however, that in each month of 1925 the earnings per day and per hour show increases over the earnings made in the corresponding months of 1923 and 1924. The average increase over 1923 is only about 4 per cent, but if the railways were employing as many men as in 1923 this apparently small increase would be costing them $120,000,000 annually.

The public is entitled to know the facts about railway wages, whatever they may be, and we intend to continue to present them even at the risk of being accused of "misrepresentation" by those who do not take as much pains as we do to ascertain them and state them correctly.

Are You Getting What You Are Paying For?

IN spite of the fact that the railways spend more for ties than for any other single class of material except fuel which they use, many of the officers most directly concerned know relatively little about the quality of the material they are receiving other than that gained from reports of subordinate officers. Probably no other single factor has contributed more to the present tie problem than the lack of familiarity of engineering and purchasing executive officers with their own stocks of ties. The American Railway Engineering Association has prepared specifications for ties which have been adopted by more and more roads until they may be said to be in general use today. These specifications, if properly enforced by inspection, will provide good ties in a sufficient variety of sizes to meet the needs of any road. It is in the inspection, however, that serious shortcomings prevail.

Fortunately for the convenience of executive officers most of the ties used are assembled at treating plants or other central points on or adjacent to their lines and it is possible to ascertain the extent to which the specifications are being enforced by examining the ties on hand at any time. The first requirement of such an examination is that the ties shall bear the mark of the inspectors, identifying them and showing the grade for which each tie is accepted. As essential as this requirement would appear to be, it is ignored on not a few roads, rendering it impossible to check the work of an inspector, a condition which is to say the least unfortunate. With the ties identified, it is easy for any officer to check them as to size, workmanship and freedom from decay at any time that he may desire, the only equipment needed being a pocket rule and an elementary knowledge of what a tie should be.

In view of the magnitude of the expenditures for ties, such a check is worth while. It should not be delegated to a subordinate but is worthy of the attention of the executive officers themselves. A purchasing officer should know from his own observation that he is receiving the ties which he has specified and paid for, while the engineering and maintenance officers should likewise satisfy himself that the ties are being purchased which he has determined to be necessary for the requirements of his tracks. On those few roads on which such examinations have been made conscientiously, the results have been almost universally surprising and in many cases disheartening.

The tie problem will never be solved until executive officers themselves take sufficient interest in the subject to examine in sufficient detail the ties for which money is being spent to know that they conform fully to the specifications. It is largely because of this lack of intimate personal contact with this subject and the delegating of this supervision to subordinates that the tie problem has arisen. Do you know that the ties purchased on your line conform to the specifications under which they were bought?

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Labor Laws of the United States. Bull. No. 370 of the U. S. Bureau of Labor Statistics. Contains labor laws, except those on workmen's compensation, including the legislation of 1923 and 1924. 1240 p. Pub. by Govt. Print. Off., Washington, D. C. $1.60.

Northern Pacific Land Grants. Hearings before Joint Congressional Committee on Northern Pacific Land Grants, March 18-May 20, 1925. 3089 p. in 6 vols. Pub. by Govt. Print. Off., Washington, D. C. Apply to the Comm, U. S. Capitol, Washington.

Railway Returns, 1924. Report of the capital, traffic, receipts and working expenditure, etc., of the railway companies of Great Britain. 152 p. Pub. by H. M. Stationery Office, London, England, £1, 1s.

Royaume de Belgique. Chemins de Fer et Service d'Electricité [etc.] *Compte rendu des opérations pendant les années* 1914 *à* 1919. Report by Belgian Minister of Railroads, Marine, Posts and Telegraph on operation during war years. Continues series of annual reports interrupted by the war. 237 p. Pub. by Imprimeries Nationales des Militaires Mutilés et Invalides de la Guerre, Liége, Belgium.

Periodical Articles

The Farmer and His Common Carriers. Where Road and Rail Systems Fit, by R. E. Plimpton. On co-ordination of transportation. Bus Transportation, August 1925. P. 367-371.

Motor Buses as Railroad Competitors, by Robert P. Crawford. Situation in Middle West, regulation, etc. Barron's, Aug. 10, 1925, p. 3, 12.

New Laws to Regulate Motor Vehicles, by Herbert L. Towle. States regulating motor vehicles as common carriers, p. 198-199. Amer. Review of Reviews, Aug., 1925, p. 197-205.

Railroad Union-Management Cooperation, by O. S. Beyer, Jr. Applied particularly to railroad shops. American Federationist, Aug., 1925, p. 645-653.

Letters to the Editor

[The RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]*

An Employee on Stock Ownership

BETHLEHEM, Pa.

TO THE EDITOR:

The writer, a life-long railroad employee, desires to take exception to the tenor of an article entitled "Selling Stock to Employees" by J. C. Harvard in your issue of July 4.

Our company used no propaganda, persuasion, nor inducement to have its employees buy stock, and the idea originated with an employee in the ranks.

We know the directors and officials to be good business men, whose aim is to conserve the property and operate it efficiently.

We do know that for several reasons, the feeling between officials and workmen has undergone a great change for the better.

In reply to Mr. Harvard's questions:

Q—How many shares do you own? A—5. Bought 10 at 52 and sold at 84.
Q—Has the price risen or fallen? A—Stationary.
Q—What proportion does the railroad stock bear to your total wealth, including your home if you own one? A—3 per cent.
Q—Are you pleased with the idea? A—Yes.
Q—Do you know of any employees who own stock and are not pleased? A—No.
Q—Are they men whose opinions are intelligently formed and worthy of respect. A—Yes.
Q—How well are you acquainted with your nearest superior officers? A—Well acquainted.
Q—Has the stock ownership made acquaintanceship easier? A—No effect.
Q—Has it had any effect in making pleasanter the relations of employee, one with another? A—No effect—relations always pleasant.

ONE OF THEM.

A & B Work Affects Maintenance Ratio

CHICAGO

TO THE EDITOR:

I have read with much interest the article in the *Railway Age* of July 25, by J. L. White, on the need for maintenance of way cost data. I agree fully with what Mr. White has said, but I would like to call attention to one item in a comparison of maintenance of way and structures expenses that affects the ratio very materially, and which I think should be segregated by the Interstate Commerce Commission and by the railroads in order that they may make a comparison between the maintenance of way ratio of different years on their own railroad intelligently and in order that they may make an intelligent comparison with other railroads. The point to which I have reference is the maintenance of way expenses incidental to improvement work.

A road carrying on a large improvement program will have a much heavier maintenance of way ratio than a road whose improvement program is small. Many railroads get the idea that they are doing a good job in keeping down maintenance of way and structures expenses when they compare their ratio with other roads when the fact that they have a small improvement program may be the

cause of their ratio being low. The maintenance of way ratio in connection with improvement work will increase about two-thirds of one per cent per million dollars of additions and betterments expenditures, so that a road spending three million dollars on additions and betterments in connection with maintenance of way and structures will have its maintenance of way ratio increased about two per cent, and a railroad spending six million dollars for additions and betterments in connection with maintenance of way and structures about four per cent. Therefore when you compare a road which is spending six million dollars for additions and betterments in connection with maintenance of way and structures with a road that is spending but two million dollars of additions and betterments money, the road making the larger expenditure will, even with the same economy in handling its straight maintenance, show a maintenance of way ratio 2 2/3 per cent higher than the railroad spending but two million dollars.

The railroads today are watching their maintenance of way ratio and that of their neighbors, but they are handicapped in using these figures intelligently owing to the fact that the maintenance charges in connection with additions and betterments work are not segregated in the records from the maintenance charges in connection with ordinary upkeep.

C. A. MORSE,
Chief Engineer, Chicago, Rock Island & Pacific.

Is Valuation Being Given Proper Attention?

ST. LOUIS, MO.

TO THE EDITOR:

Following are a few suggestions concerning railway valuation, which it is thought should be brought to the attention of some of the operating officers.

From the writer's observation, it appears that railway valuation is not being given the consideration that this important subject is entitled to by a large number of operating officials, particularly the order of the Interstate Commerce Commission known as Valuation Order No. 3, which requires the setting up and reporting of all changes in the physical property of the carriers since their dates of valuation.

The attention of the operating officials seems to be so centered on getting any improvements or changes in the property in service, that they lose complete sight of the importance of properly reporting the units of property involved and the proper segregation of the costs thereof.

The Interstate Commerce Commission, by the Transportation Act of 1920, is committed to the policy of maintaining a rate structure that will provide for a reasonable return upon the investment in railway property plus a reasonable cost of service for all the railroads in the United States.

As the writer views it, the only point of contact between the owners of railway securities and the Interstate Commerce Commission under the existing laws, is the railway valuation as originally determined and kept current as prescribed by the commission.

The protection of the security owner in his investment is just as important as prompt and efficient service to the public by the operation and maintenance of an adequate transportation machine. Without proper protection to the security owner, capital for maintenance and operating an adequate transportation machine is withheld.

The operating officers can render a real service to the owners of railway securities as well as to the public by protecting the security owners in their investment. They can do this by closer supervision of all operation, involving capital expenditures, and by seeing that such operations are accurately reported as to the property units and costs involved, in line with the rules prescribed by the Interstate Commerce Commission.

JUNIUS H. RAWLINGS.

A College Man in the Operating Department

FLORIDA

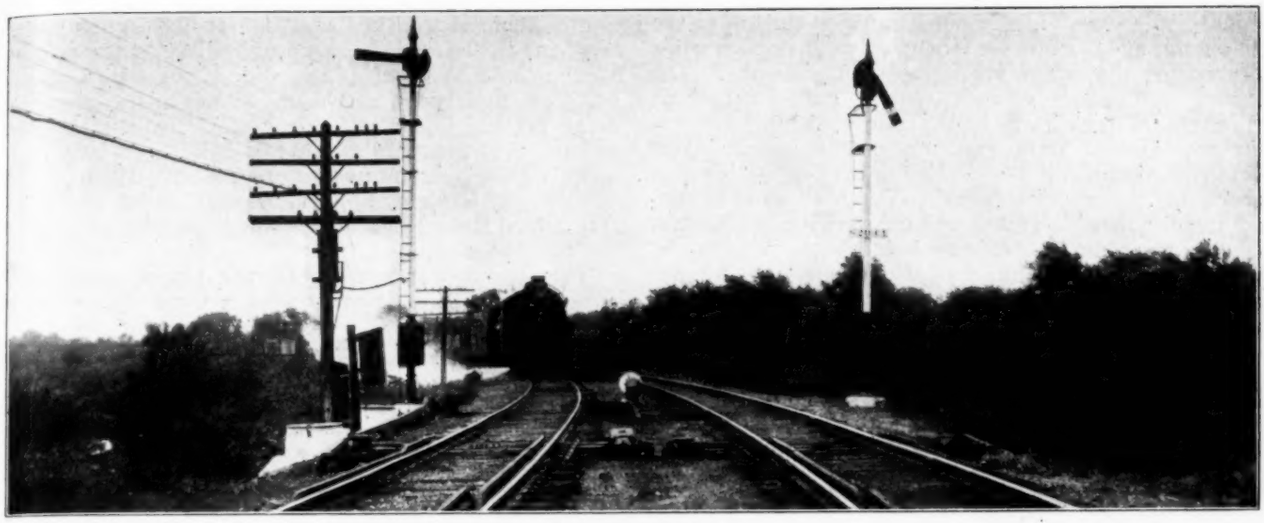
TO THE EDITOR:

Most of the articles I have read in your recent issues on the college man and his place in the railroad game are from high officials who have arrived, or young men just starting.

Without playing the personal pronoun to the point of obtrusiveness I am going to try and give the version of a college man occupying middle ground. Fourteen years ago the writer walked from the platform with a sheepskin bearing the usual "Know all men by these presents" and chronicling the fact that said party had successfully passed all requirements to obtain a degree in civil engineering. The railroad game appealing strongly a position as draftsman was accepted in the chief engineer's office of a trunk line. Later the construction field presented an opportunity for slight increase in salary as masonry inspector and assistant resident engineer upon a residency removed from all social activities. From this to supervisor in charge of steam shovel operations building terminals, thence to roadmaster of construction in charge of track laying. This consumed five of the fourteen years and having come in contact with the transportation department a great deal during this time, the desire to get into the high tension part of the game caused me to renounce what little of professional prestige was left in my make-up and accept a lesser paying position as assistant yardmaster at a large terminal; later promotion to general yardmaster of a smaller terminal, then the same position at one of the largest terminals on the line. Eight years went into this molding process and the last year as trainmaster brings me up to date.

If a college man can embrace railroading in a manner that he may sustain himself and his pride through the process of curtailment of the frills and fancies he naturally launches his career with and can stand the operation which shears him of all the gloss and veneer down to the residue of common sticktoitiveness then he may expect success and not until then. It would prove too lengthy a procedure to go into details explaining the hard knocks, the plugging on and on in the face of seemingly insurmountable obstacles, the apparent unfairness of man to man, long hours of slugging for a goal, the slowness of promotion and any number of other discouraging features. On the other hand the game is worth the candle when the crucible renders the worthwhile man who sees himself more nearly as others see him and the scheme of the greatest of all games gently unfolds itself to him. The college man has his place in the game, most assuredly, but it is a place on par with the rank-and-file. If I were asked what good comes of my college training the answer would be in the association with other men and the human elements derived from that association and the foundation laid in my studies. All told, merit and merit alone spells success in the game as pointed out by Mr. Begien in last paragraph of his article in your May 16 issue.

TRAINMASTER.



Derails and Signals on Main Line Approaching Junction, from the east, Burlington, Iowa.

C. B. & Q. Controls Switches Remotely

Distant ends of passing tracks and junction switches operated electrically, eliminating train stops

THE Chicago, Burlington & Quincy has been using electric switch machines controlled remotely for the operation of passing track and junction switches at several points for about eight years. At present, junction and crossover switches are worked in this manner at five points and passing siding switches at

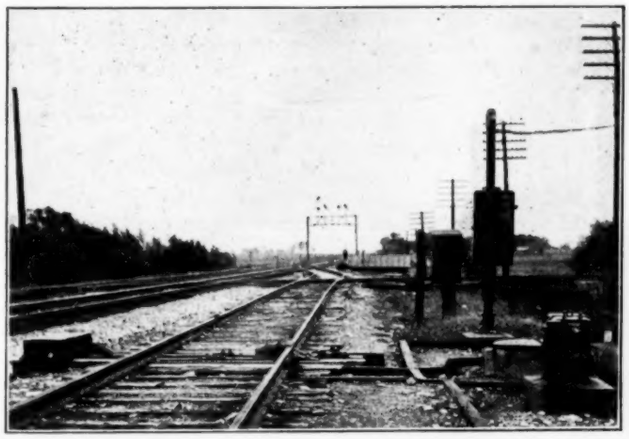
Two of the Switch Machines at East End of Center Passing Track, Mendota, Ill.

four points. These installations have been the means of eliminating train stops for movements in or out of the siding and over junction switches and the control has been located, in most cases, in existing interlocking towers or in telegraph offices, the levers being handled by the levermen or operators, thus saving any additional labor charge for the service.

The Burlington uses a separate power switch machine for each switch or derail, which, with the necessary signals, costs about $5,100 for the outgoing end of one siding situated one mile from the operator. When so used they enable trains to head in on a passing siding without stopping to open the switch ahead of them, and trains leaving a siding to continue accelerating speed without having to stop or slacken to permit the switch to be closed behind them. It is estimated that the elimination of three stops a day at a given switch pays for the cost of maintenance, interest on the investment and depreciation. An explanation of the application of remote control to several different layouts on the Burlington follows.

Remote Control of Junction Switches

The single track Quincy branch from the south joins the main double track line on the Illinois side of the

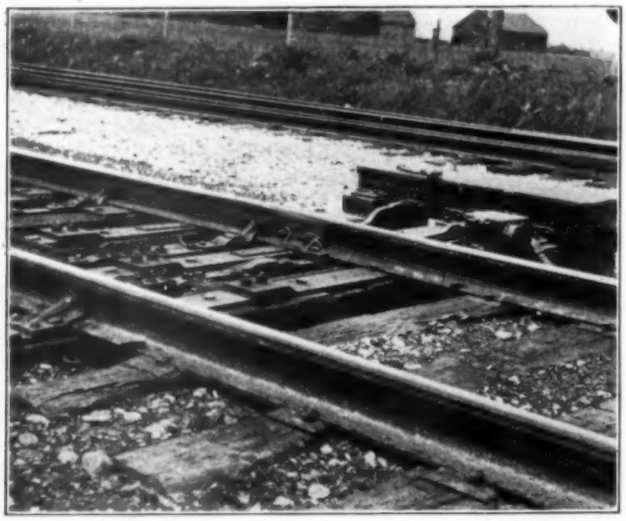


View Looking East, Showing Dwarf Signal and Derail on Siding at Earlville, Ill., Railroad Crossing in Background

Mississippi river, just across the bridge from Burlington, Iowa. The time required for branch line trains to stop and throw the junction and crossover switches by hand caused relays not only to those trains but also to main line

trains. Train stops for eastbound trains on the bridge are undesirable and likewise westbound trains if stopped while approaching the bridge are started with difficulty. The Burlington operates seven passenger trains and about 15 freight trains each way on the main line at this junction and there are two trains each way on the branch. With these circumstances it was decided to operate the junction switch and the crossover switches electrically and to control these switches, together with the derails and attendant signals governing movements over these switches, by means of levers located in the existing interlocking tower on the Iowa side of the river over a half mile away. This installation, which was built in 1918, virtually constitutes an interlocking with all of the advantages of eliminating the stopping of trains while with the low-voltage operation and remote control the advantages of interlocking are secured without additional cost for levermen. In addition, these derails also serve to protect the draw bridge from the Illinois side and make it possible, if necessary to derail a train, to derail it on solid ground instead of on the bridge.

At Earlville, Ill., a single track branch line crosses a passing track and two main tracks at grade. All train stops for this crossing as well as when leaving the passing track were eliminated by installing a low-voltage interlocking layout to include the passing track switch, the five derails and the signals governing the several routes. The levers controlling these functions are located in the tower of a mechanical interlocking at a crossing of the Chicago & North Western about 4,000 ft. away. By operating this additional interlocking from this tower the advantages of an interlocking were secured without any additional expense for operation. The cost of installation was $13,000 and it makes possible an annual saving of

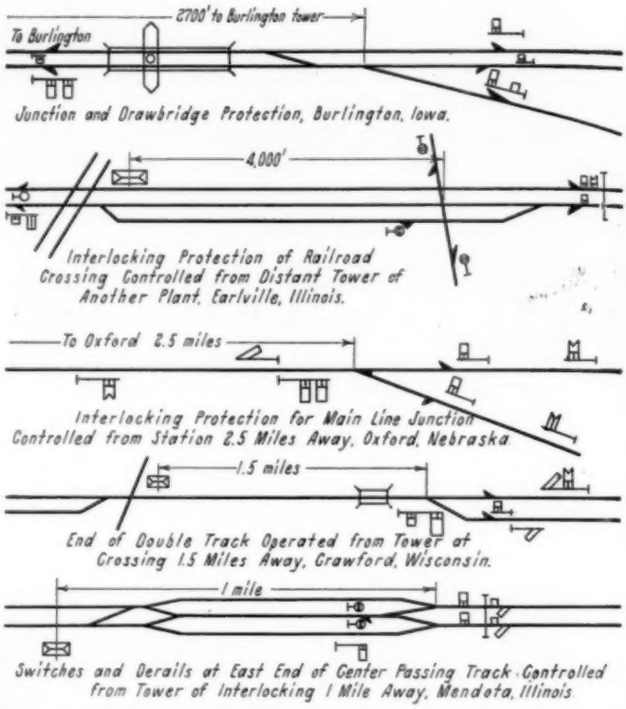


A Typical Electric Switch Machine Layout on the Burlington

$4,900 in towermen's wages which would have been required if a separate interlocking had been installed.

At Oxford Junction, 2½ miles east of Oxford, Neb., the Denver-Lincoln line branches off the Denver-Kansas City line. The Lincoln-Denver line handles five passenger trains and about eight freight trains each way per day, while the Denver-Kansas City line has three passenger trains and about five freight trains each way. It was necessary that all trains on the Kansas City line stop to operate this junction switch. The installation of an interlocking with 24-hour service of levermen at this point was not justified so a low-voltage remote control system, together with the two derails and signals, was installed, the control being located in the station at Oxford two miles away and the levers being handled by the operator in conjunction with his other duties. For a long time a station had been maintained at Oxford Junction, the operators doing nothing but handle this junction switch and train orders. Although this expense of $4,818 had been done away with a year or two before the installation of the present arrangement the new facilities, which cost $11,500, afford the service previously given without the operating expense.

The operation of junctions by this remote control system has been so satisfactory that a plant is now being


2700' to Burlington tower
To Burlington
Junction and Drawbridge Protection, Burlington, Iowa.
4,000'
Interlocking Protection of Railroad Crossing Controlled from Distant Tower of Another Plant, Earlville, Illinois.
To Oxford 2.5 miles
Interlocking Protection for Main Line Junction Controlled from Station 2.5 Miles Away, Oxford, Nebraska
1.5 miles
End of Double Track Operated from Tower at Crossing 1.5 Miles Away, Crawford, Wisconsin.
1 mile
Switches and Derails at East End of Center Passing Track Controlled from Tower of Interlocking 1 Mile Away, Mendota, Illinois

Track and Signal Plans for Typical Layouts Where Remote Control Switch Operation Is Used

installed at Cobb Junction, west of Lincoln, Neb., situated nearly eight miles from the point of control.

A switch for an industry track about 1,500 ft. from an interlocking tower was installed in the main line near Murray, Mo., and it was arranged to operate this new switch with power machines with an electro-mechanical addition to the machine on account of the fact that an enlargement of the mechanical machine would have been very expensive. The outgoing switch of a large yard at Davies, Mo., is located in the main line about 5,000 ft. from a railroad crossing where there is an interlocking plant and it was arranged to operate this outgoing switch by power machines and save employing switchtenders. The cost of this installation was $4,300 while the annual cost of switchtenders would have been $5,168.

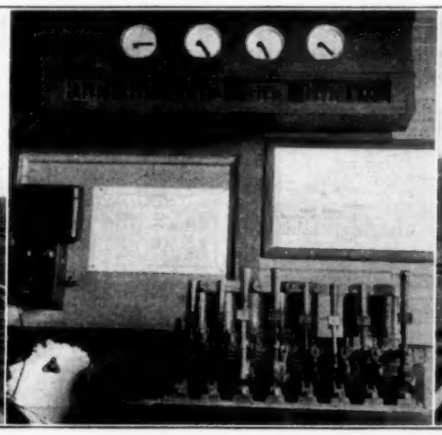
Ends of Double Track Handled Economically

At several places on the Burlington, where the switch at the end of double track would otherwise necessitate train stops, this switch, together with the signals protecting the movement of trains, are operated electrically by low-voltage motors and are controlled by levers in nearby stations or towers. For example, at Bridge Switch, Wis., the switch at the end of double track is controlled from the tower at a railroad crossing at Crawford, 1½ miles away, thereby eliminating the necessity for trains stopping.

This line handles four passenger trains and about eight freight trains each way per day. This installation cost about $9,000, as compared with a separate interlocking which would have cost $7,500 and necessitated the services of operators at $4,900 a year.

A somewhat similar arrangement was installed at the end of a passing siding at Armour, Mo. A crossover located about 5,000 ft. from the actual end of double track is used for the operating end, the extra track being used as an advance passing siding. The distant switch is operated by a power machine controlled from the station, which cost $5,200 and eliminates many train stops. The control of this switch is in the hands of the operator at the station 5,000 ft. away. At Shannon, Iowa, the mechanical interlocking at the end of double track is being replaced by a low-voltage electrical layout to be controlled from levers in the interlocking plant at Harrison which is the other end of a short piece of single track 3.9 miles long.

Train operating Over Switch, Oxford Junction



Levers and Indicators in Station, Oxford, Neb.

View of Switch at Oxford Junction

Permits Great Economies at Passing Track Switches

In locations where grades are adverse for the starting of trains, either in entering passing sidings or in starting trains after stopping to close the switch when pulling out, the use of switch machines to operate passing track switches has proved to be an important factor in reducing delays and in reducing the number of pulled-out drawbars and other unnecessary wear in equipment.

On the double track main line through Mendota, Ill., the west end switches for a middle passing track are operated mechanically by pipe connections from a mechanical interlocking machine. The three switches at the east end of this siding as well as the derail on the siding, together with the necessary signals, are operated by low-voltage motors, controlled by a separate set of levers in the tower about one mile away. This installation, which cost $18,500, facilitates train movements out of a congested yard.

In the double track line through Oneida, Ill., lap sidings are used, the entrances to which are at the station and are handled by the station operator. The sidings are 5,000 ft. long and the outgoing switches were handled by trainmen, making it necessary to stop the trains to set the switches behind them. The switch of the eastward siding is 5,000 ft. from the station and at the foot of a grade, making it difficult to start a heavy freight train after stopping to pick up a brakeman after he has reset the switch behind it. To avoid such stops and the consequent delays this switch was equipped with a power machine controlled by the operator in the station, at a cost of $5,200, which has not only saved the cost of making the stops but has appreciably shortened the time of eastward freight trains which have taken the siding at this point.

In most cases, as shown by the foregoing, the Burlington has installed remote control power switch machines to enlarge the scope of an existing interlocking plant and in that way get the advantage of the facility without increasing operating expenses. One installation proposed for this year, which is estimated to cost $13,000, will completely eliminate an existing interlocking plant which costs $4,900 per year for labor to operate.

Former Labor Leader Praises Railway Officers and Bankers

THE initiative and enterprise shown by railway officers in adopting the use of new devices that will promote safety and efficiency, and the backing given them by financial interests in doing so, were paid a tribute by George N. DeGuire, formerly manager of the Department of Equipment of the United States Railroad Administration, in an address delivered at the recent annual convention of the Brotherhood of Locomotive Firemen and Enginemen at Detroit.

Mr. DeGuire, who is now vice-president of the Premier Guaranteed Mortgage Bond Corporation of New York City, was formerly a member and a director of this brotherhood, and succeeded Frank McManamy as head of the Department of Equipment of the Railroad Administration. His remarks regarding the attitude and policy of railway officers and bankers were elicited by a resolution which had been presented in which it was proposed that the convention recommend to the Interstate Commerce Commission that it require application of thermic siphons to all new locomotives purchased or built in the future, and also to existing locomotives as they go through the shop for heavy firebox work. Following Mr. DeGuire's remarks, and in accordance with his recommendation, the resolution was modified to direct that the matter in question be taken up direct with the officers of the railroads rather than with the Interstate Commerce Commission.

Mr. DeGuire said he felt sure if the question was taken up with the proper officers of the railways "you will

secure favorable consideration on the part of our railroad presidents, chief mechanical and other officers.

"I base this opinion," he added, "not on what I thought of these officers, and what I believe was their attitude when I was a younger man in the railroad field, and a delegate to your previous conventions, but on what I know is their attitude after dealing with them in a big way prior to, during and subsequent to federal control.

"When I entered the railroad field some 25 years ago I thought railroad officers, from the president all the way down the line, had little or no interest in their employees, and thought only of dividends and the bankers of Wall street. Many of you may be of the same opinion today, but I want to say this opinion is entirely in error. Railroad officers, as a general rule, have your interests at heart and it is too bad that steps they take to better your conditions are so often misunderstood and so often unjustly criticized. So far as the bankers of Wall street are concerned, never has a banker stopped or attempted to stop installation of devices sought by this brotherhood to improve your conditions. They have arranged to finance the purchase of new locomotives equipped with siphons, superheaters, air doors, electric headlights, brick arches, feedwater heaters, coal pullers, stokers and what not, all of which brought better working conditions for you and the men you represent. The bankers are an essential part of railroad operation today, and without their aid and the use of the machinery they have built up, the railroads would cease to buy new power and improve.

"The railroads must have an outlet for their securities if they are to go on. Wall street, and its bankers are, as a general rule, the only medium through which this can be accomplished successfully and they do it for a mighty small margin of profit.

"Many people believe the bankers of Wall street buy and hold securities issued by the railroads. The real facts in the case are that the securities of the carriers pass to and through these bankers to thousands, yes, millions, of purchasers in the four corners of the world. It will thus be seen that the bankers of Wall street are not the people you may have believed them to be, but are really doing the things that tend to make our railroads the best in the world. When they do this they are doing a real service for railroad employees and for every other citizen in the United States and Canada, and we all, the farmer, manufacturer, merchant, in fact all engaged in industrial and commercial activities, prosper only in so far as railroads make it possible by efficient service. The presidents, chief mechanical and other officers on your respective railroads are as human as you and I; they are big, broad, wonderful men and will meet you in your plans more than half way. Try them.

"While I do not wish to, in any manner, influence your action regarding this siphon, it appears to me it would be a mistake to handle this question with the Interstate Commerce Commission until every effort has been exhausted to secure favorable action direct on the part of railroad presidents and their chief mechanical officers.

"Having served on both General Grievance and Legislative Committees for this brotherhood in years gone by I know railroad officers have always taken the position, and justly so, that you treated them unfairly when you attempted to secure relief by legislation instead of first laying your requests before them for consideration."

In substantiation of his views Mr. DeGuire said that prior to July, 1918, no thermic siphons were in use and that now over 1,500 locomotives are operating successfully with them on more than 70 railroads in the United States and Canada, the largest users being the Missouri Pacific, with 314 locomotives equipped, the Chicago, Rock Island & Pacific, with 247, and the Illinois Central, with 216. Discussing the device as a means of increasing safety, and also saving fuel and increasing firebox life through improved circulation, he said he believed the officers of the railways "should be commended for the interest taken in the welfare of the members of this organization and other railroad employees."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loadings totaled 1,043,063 during the week ended August 1. It was the third consecutive week in which the total exceeded the million-mark. Loading was heavier by 13,460 cars than in the previous week and exceeded the totals for the corresponding weeks of 1924 and 1923 by 97,450 and 9,597 cars respectively.

The loading of all commodities increased over the week ended July 25, with the exception of ore, and was larger than in the corresponding week last year, with the exception of grain and grain products. Loading was higher in all districts, except Pocahontas, than in the previous week and higher in all districts than a year ago. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING—WEEK ENDED SATURDAY, AUGUST 1, 1925

Districts	1925	1924	1923
Eastern	249,336	221,913	249,508
Allegheny	209,838	190,836	222,578
Pocahontas	53,519	42,412	43,153
Southern	144,875	131,487	130,946
Northwestern	157,969	139,057	172,922
Central Western	157,502	151,625	150,273
Southwestern	70,024	68,283	64,086
Total Western	385,495	358,965	387,281
Commodities			
Grain and grain products	50,943	56,670	52,894
Live stock	27,754	26,472	30,527
Coal	180,936	145,636	190,509
Coke	9,441	6,900	13,478
Forest products	71,593	66,934	76,091
Ore	63,684	55,038	83,565
Mdse. l.c.l.	255,159	239,885	240,593
Miscellaneous	383,553	348,078	345,409
Total	1,043,063	945,613	1,033,466
July 25	1,029,603	926,309	1,041,415
July 18	1,010,970	930,713	1,029,429
July 11	982,809	909,983	1,019,809
July 4	864,452	757,904	850,082
Cumulative total, 31 weeks	29,228,525	27,655,674	28,979,703

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended August 1 totaled 50,805 cars, a slight decrease from the previous week, due principally to a slump of 878 cars of grain and smaller decreases in lumber and pulpwood. Gains were recorded for live stock of 311 cars, for coal 250 cars and for merchandise 340 cars, other commodities showing little change. Compared with the same week last year there was a gain of 1,943 cars, despite a decrease of 2,478 cars of coal. The increase in merchandise loading was 699 cars and in miscellaneous freight 2,141 cars.

Commodities	Total for Canada: August 1, 1925	July 25, 1925	August 2, 1924	Cumulative totals to date: 1925	1924
Grain and grain products	3,789	4,667	3,704	176,837	242,187
Live stock	2,357	2,046	2,186	67,437	66,433
Coal	2,192	1,942	4,670	102,869	149,449
Coke	245	261	153	8,498	7,192
Lumber	3,894	3,993	3,602	106,964	111,940
Pulpwood	2,159	2,432	2,045	91,509	92,877
Pulp and paper	1,961	1,904	1,728	63,063	61,648
Other forest products	2,597	2,688	2,206	90,585	84,315
Ore	1,622	1,477	1,419	40,971	37,276
Merchandise L.C.L.	15,779	15,439	15,080	462,354	439,984
Miscellaneous	14,210	14,152	12,069	360,572	355,027
Total cars loaded	50,805	51,001	48,862	1,571,669	1,648,328
Total cars received from connections	34,326	34,045	27,445	1,017,775	996,411

Relation of Stores to Other Departments*

Enormous expenditures for materials and supplies emphasize necessity of sympathetic co-operation with stores department

By U. K. Hall
General Supervisor of Stores, Union Pacific System, Omaha, Neb.

STATISTICS are usually dry, but there are times when they are necessary in order to realize just what a situation is. During 1923, Class I railroads of the United States purchased fuel, materials and supplies to a total value of $1,738,703,000. During 1924 a slightly lesser amount was expended, namely, $1,343,055,000. This represents daily disbursements by the Class I railroads during 1923 of $4,763,570, and for 1924 of $3,679,602. On the Union Pacific the actual consumption of materials during 1923 was $69,068,492, or an average issue every day in the year of $189,229. The value of material on hand on Class I railroads in the United States today approximates $650,000,000.

Third of All Revenue for Supplies

Further statistics from the Bureau of Railway Economics show that from 1920 to 1924, 30.14 cents, or practically one-third of every dollar of gross revenue was expended for materials. Such figures bring home forcibly the realization of the need for a separate and distinct organization to handle such a problem. In the inception of railroading and on some roads until within very recent years, there was no separate and distinct stores organization. But as the investment in materials and supplies became larger and larger, executives realized that the responsibility could not be considered as a side issue of any department already heavily burdened, hence the "new occasion," resulting in the organization of stores departments.

The stores department is primarily a department of service and only as it performs this service is it justified in its existence as a separate and distinct part of the great railroad family. There is no other branch of railroad service that so intertwines itself with all other departments. What interests the stores department, to a greater or less extent, interests all other departments.

There are three distinct views relative to the material situation. The users of the material want the material on hand in necessary quantities to meet any needs, either for average conditions or any unusual conditions that may arise. The purchasing department very naturally desires to purchase at the best market conditions and through its organization endeavors to save money on the purchase price of materials. The stores department is charged with the responsibility of having materials on hand in sufficient quantities to meet the needs, but with a due regard to the amount of the material investment.

Material Is Money

This latter phase is where the fine art of railroad storekeeping comes in, and it is the point where the users of materials and those responsible for its care and custody generally separate. The average user of material, possibly more in the past than at the present, does not feel that the company's money has been spent until the value of materials are actually charged into his operating accounts. But so far as the company's coffers are concerned the money is spent at the exact moment the treasurer passes the purchase bill covering the value of such material and as far as the ultimate results are concerned there is no difference between the time when the bill is paid and when the materials are afterwards charged out into operating expenses. After the money has once gone out, later transactions are merely bookkeeping. The damage has already been done if material is not ordered sparingly or used promptly.

It is realized, of course, that special materials must be carried in certain cases but there are many times when material has been so ordered simply because some one thought he might need it, taking no cognizance whatever of the 16 per cent such materials are costing the company to carry.

What is the Service of Supply? The organization is one that—

1. Records, deals with and brings forth a knowledge of the needs of the using department.
2. Has a knowledge of what is actually on hand or available at all points for use.
3. Has a knowledge of the movements or requirements of such materials and supplies.
4. Follows a correct method of disbursing materials.
5. Has a proper method of accounting for such items to bring forth the most correct results.
6. Has an organization that will handle or supervise the reclamation of discarded material.

The first three factors mentioned can be controlled by the store department only through the medium of a modern, up-to-date, thoroughly equipped stock book. The average stock books contain from 50,000 to 70,000 items in accordance with the size of the road. Stock books to be of any value must be accurate. Accuracy can only be secured by being able to count the number of items on hand thoroughly and quickly. These can only be counted when they are properly piled or stored. The majority of railroads have made great strides during the past few years in perfecting measures to carry such practices into effect. They have unit piling of material, traying systems, open or daylight racks, island or unit platforms, etc. Each day is adding new ideas and working towards greater efficiency. I believe that there has never been a time in the history of railroading when the stock books more nearly reflect the true material situation than they do today.

As regards the value of the materials and supplies, the maintenance of way department is the largest user.

*From an address before the Pacific Railway Club, San Francisco, Cal., July 9, 1925.

Most of the roads at the present time operate supply trains. In the interest of co-operation in this branch of service, calculated to secure the greatest efficiency, maintenance officers might well inquire if their representatives are accompanying the monthly trips of the supply train; if they check up materials and tools on hand before any of the new supply is issued, to see that the new supply is actually needed; if they know the value of the materials and tools on the section tool lists or of the materials delivered monthly.

In the shops is the shop delivery. Here again there is a necessity for the closest co-operation to bring about economies. It might well be asked whether shop officers look far enough in advance so that materials can be delivered through the regular channel rather than on a special trip; if they are willing to accept substitutions of materials already in stock, thus reducing the investment and saving a possible purchase; if when ordering material there are materials in the shop not being used but which could be utilized; if there is no surplus or inactive material lying around without regard to what it costs to handle such materials—first their issuance from the store, the tying up of this investment at a cost of 16 per cent, and then their return to the store with the incident expense of again putting them on the shelves in the storehouse.

Scrap Pile Losses High

Reclamation is another stores operation which is highly specialized but where greater results could be secured if all concerned worked together. Too often materials are found in the scrap pile which should not be there. Often materials are released which still have considerable life and which could have been utilized for a longer period, but which when once released are not of sufficient value to replace. This results in a direct loss and a hidden loss, which is therefore harder to locate, as often usable materials are thrown in the scrap which when forwarded to the stores department, are damaged in transit or tie up that amount of investment while in transit. It is especially important to instill employees with the spirit of making the best they can of materials that have been so reclaimed and reworked.

In no other stores activities is the co-operation of users of materials required more than in securing correct accounting. The accounting departments are at all times striving to bring about the most correct results, and as far as the material situation is concerned this can only be done by the users furnishing requisitions promptly in the month in which the material is drawn for all materials and supplies taken. It is seldom realized what large quantities of materials are to be found at repair tracks and roundhouses and shops and along the line of road that are in the "material on hand" account of the stores department but in the actual care and custody of the users. Many of the smaller stocks do not have store department employees in charge. Thus it devolves upon the users of the material to furnish requisitions for each and every article that they take from stock and put into use. Only as this is done is our accounting correct. When materials are taken and requisitions not furnished the result is an embarrassing situation.

In the last few years a new feature of the material situation has been developed, perhaps not new in one way, but new in the general view that has been taken of this subject. This is what is known as "simplification practice."

Simplification is a big problem, not only as far as the railroads are concerned but in commercial America as well. The Department of Commerce is authority for the statement that a large chain hotel company, by reducing the number of items in stock 20 per cent, released $350,000 from former inventories, and saved $100,000 per year. This tremendous saving by a hotel company with its very limited number of hotels visualizes the tremendous savings to be made on railroads which deal with 50,000 to 70,000 items. The railroads have been striving for simplification extensively during the last year or two. At the St. Louis meeting of Division VI, Purchases and Stores, of the American Railway Association, G. A. Secor, general storekeeper of the Chicago & Alton, presented facts and figures of what had been accomplished on that road during the past year, which are submitted in part as follows:

Some Results of Simplification on the Chicago & Alton

Class of Material	Number Items
Frogs, switches, crossings, track fastenings, track bolts, spikes, etc.	119
Interlocking and signal material, telephone and telegraph material.	1,066
Bolts, nuts, washers, rivets	690
Bar iron and steel	230
Boiler, firebox, tank and sheet iron	411
Forgings and pressed steel locomotive parts, car forgings	142
Locomotive and car castings	319
Standard and special appliances for locomotive (injectors, lubricators, bell ringers, sanders, stokers, etc.)	1,070
Passenger car trimmings	312
Electrical material	217
Pipe and fittings	479
Hardware and hand and small machine tools	577

On the Union Pacific the number of sizes of oak was reduced from 163 to 43, a reduction of 73 per cent.

Irrespective of what some roads have accomplished in meeting the material problem the fact remains that on the roads as a whole we have just started. There is still much to be accomplished. There is a crying need for a spirit of sympathetic co-operation, for all departments to get together, eliminate useless stocks, bring about greater reductions in economical handling and to save 16 per cent on tied-up and non-moving articles.

Commission Refuses Horizontal Decreases in Anthracite Rates

A HORIZONTAL reduction in freight rates on anthracite coal is not required, according to the Interstate Commerce Commission, but the railroads will be expected to reduce the higher rates on domestic sizes and pea coal over the longer routes to the level of rates applicable over shorter routes between the same points to restore rate parity.

Several other reductions in specific rates on anthracite are required and in addition the commission ordered the establishment of joint rates on prepared sizes of low-volatile bituminous coal to certain points in New England and trunk line territories from mines served directly by the Chesapeake & Ohio, the Norfolk & Western and the Virginian.

The commission's report made public on August 12 is the outcome of an investigation ordered on its own motion in 1923 subsequent to recommendations of the U. S. Coal Commission raising questions whether the retail price of anthracite for domestic use could not be reduced by a reduction in freight rates and whether a basis of rates could not be established on substitutes to facilitate their distribution.

The commission stated that imposition of prohibitive rates on anthracite to Canada in order to augment the New England supply is not justified. It is preferable that the solution of the domestic fuel problem be accomplished through development of trade and commerce, the commission declared, as the sources of production of household fuel for use in the New England and Middle Atlantic states are ample.

What Is the Average Life of Ties?

A "yard stick" is developed to show what may be expected from any group whose record to date is known

By W. F. Goltra
President, W. F. Goltra Tie Company, Cleveland, Ohio.

HOW long will untreated ties last? How long will treated ties last? These two questions are propounded oftener than any other concerning wooden railroad ties. Our usual reply is that "untreated ties, of all species, will last on an *average* from 8 to 10 years and treated ties from 16 to 20 years, or practically double." In our opinion that answer covers at least 97 per cent of all cases, and not over 3 per cent of untreated or treated ties will run above or below these averages.

The Average Life of Untreated Ties

The longevity of untreated railroad cross ties is variable, depending upon a multitude of factors affecting the life favorably or unfavorably, such as the species of wood, size, spacing, ballast, weight of rail, tie plates, derailments, premature removals, etc., besides the financial condition of the railways. We hear a great deal about the longevity of treated ties, but we should not overlook the fact that we have records of wonderful performances of untreated ties in track. For instance, it was reported not long ago that some cedar ties were taken out of track by the C. M. & St. P. after 52 years of continuous service, according to the testimony of the "oldest inhabitant," and that these old ties are "lying in state" at the Forest Products Laboratory at Madison, Wis. At the convention of the American Railway Engineering Association in 1921 there was exhibited a tie which had given 45 years' service before it was taken out of track on the Alabama & Vicksburg. This tie was cut of long leaf yellow pine, and is on exhibition in a museum at Vicksburg, Miss. These are remarkable specimens of untreated ties, but many more might be collected in the United States.

The average life of different species of untreated ties is pretty well known through experience gained since the beginning of steam railroads. It varies considerably owing to a multitude of collateral influences, but in general it ranges from 6 to 20 years, or an average of 8 to 10 years.

It may not be amiss here to mention one service test record of untreated white oak crossties on the Lake Erie & Western. A careful record kept by the writer of ties purchased for that railroad during a period of 24 years (1887 to 1910, inclusive), enabled him to calculate closely the average life of those ties. All of the ties were white oak or such as classed with that species with the exception of about 2 per cent, which were cedar and chestnut. The size of these ties was 6 in. by 8 in. by 8 ft. The spacing varied on different portions of the road; where traffic was heaviest more were used than on other portions of the road. Including railroad sidings, yards and industrial tracks they ranged between 2,640 and 3,000 ties per mile. A careful estimate was made of the number of ties in the road which it was necessary to maintain and due allowance was made for bridge and switch ties. The record is as follows:

Main and side tracks, 896 miles	2,562,500
Deduct for bridge and switch ties	200,000
Number of crossties maintained	2,362,500
Number of ties purchased during 13 years, 1887 to 1900, inclusive.	3,324,531
Average number purchased per year	255,733

Dividing 2,362,500 by 255,733 ties, gives an average life of 9.23 years or 285 ties per mile.

The mileage of the L. E. & W. was increased by the leasing of the Northern Ohio and additional side tracks were constructed. The mean mileage of main and side tracks between 1900 and 1910, inclusive, was 1,108 miles and the approximate number of ties in track was 3,133,000

Deduct for bridge and switch ties	222,000
Number of crossties maintained	2,911,000
Number of ties purchased during 11 years, 1900 to 1910, inclusive	3,619,012
Average number of ties purchased per year	329,001

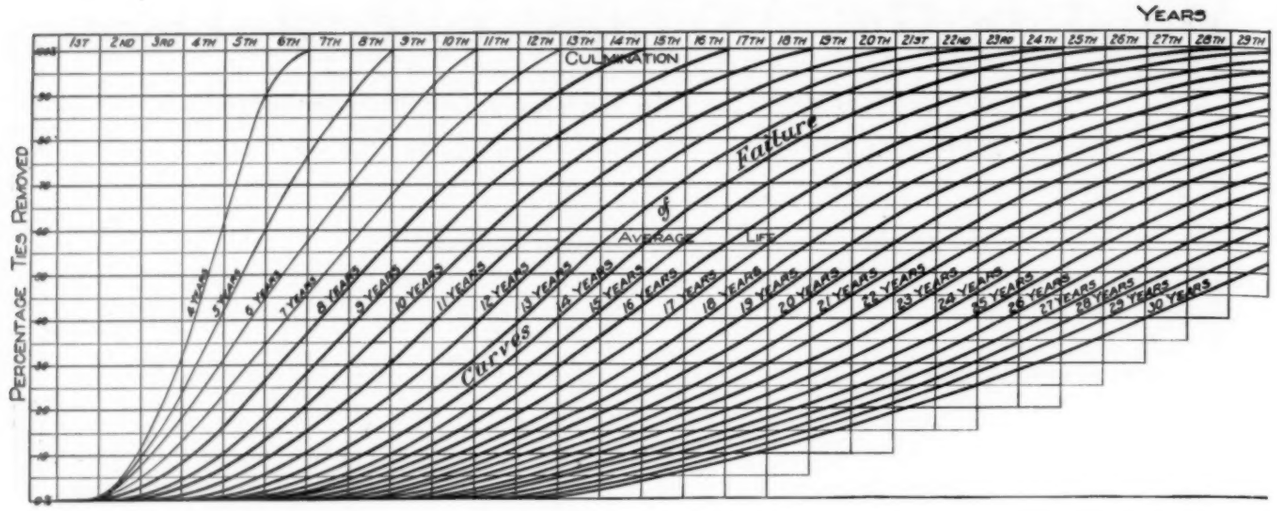
Dividing 2,911,000 by 329,001 ties gives an average life of 8.85 years or 297 ties per mile.

It will be observed that the average life of ties during the first period was a little longer than in the latter period. The reason for this, we presume, was because the renewals were made more liberally during the latter period and perhaps the ties were not of as good quality as those received during the first period. When white oak ties were plentiful a better grade could be obtained than could be secured in the last period, when the quality was gradually depreciating. Again, perhaps during the last 10 years a good percentage of red and black oak ties slipped through as white oak as commonly occurs today, and it is well known that the life of these species is at least two years less than that of white oak. Taking the two periods together we estimate the *average life* of white oak crossties to be nine years, although some of these white oak ties were not taken out of the track until after a service of 16 to 20 years; of course, perhaps only two or three per cent gave that length of service. It must also be borne in mind when calculating the average life of crossties that many go in side tracks, where they are made to last longer than those in main tracks, because it is not imperative to renew them as quickly as in main tracks.

The Average Life of Treated Ties

It is said that the Eastern Railway of France took out of its tracks some creosoted beech ties in 1915 that had been in service 56 years. It is also reported that some Baltic pine ties treated with zinc chloride by the Burnett process can be found in the British museum that were in continuous service for 58 years. However, these outstanding examples of longevity bear as little relation to the *average life* of crossties as the comparatively few persons living over 90 years bear to the average life of human beings.

Approximately two-thirds of the ties treated by the French railways consist of beech and the others of oak and other woods. The Eastern Railway of France adopted creosote for the treatment of its ties in 1859. Occasionally we hear it said that creosoted ties have been known to last 30 years in France and creosoted Baltic pine ties give a service of 30 years in track in England. It should be understood that this is not the *mean or average life* and cannot possibly be for if one will trace the line on the chart accompanying this paper for ties having an *average life* of 30 years, he will find that the last tie removed would last 58 years. We admit that ties treated in Europe, particularly by the French railways, have a longer *average* life than those treated in America, for the simple reason that the work is probably done more thoroughly, but from the



Ave. Yrs. / Years	4 P	4 A	4 T	5 P	5 A	5 T	6 P	6 A	6 T	7 P	7 A	7 T	8 P	8 A	8 T	9 P	9 A	9 T	10 P	10 A	10 T	11 P	11 A	11 T	12 P	12 A	12 T	13 P	13 A	13 T	14 P	14 A	14 T	15 P	15 A	15 T	16 P	16 A	16 T
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	12	12	24	9	9	18	9	9	18	6	6	12	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	20	32	60	15	24	45	11	20	33	8	14	24	5	7	15	3	3	9	3	3	9	3	3	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	32	64	128	18	42	72	13	33	52	10	24	40	7	14	28	7	10	28	5	8	20	3	6	12	1	1	4	1	1	4	0	0	0	0	0	0	0	0	0
5	28	92	140	20	62	100	13	46	65	11	35	55	10	24	50	9	19	45	5	13	25	4	10	20	3	4	15	2	3	10	3	3	15	1	1	5	0	0	0
6	8	100	48	13	75	78	13	59	78	12	47	72	11	35	66	9	28	54	8	21	48	6	16	36	6	10	36	4	7	24	3	6	18	2	3	12	2	2	12
7	100		400	13	88	91	9	68	63	12	39	84	11	46	77	9	37	63	8	29	56	7	23	49	6	16	42	5	12	35	4	10	28	3	6	21	2	4	14
8				12	100	36	10	78	80	7	66	56	12	58	36	10	47	80	9	38	72	8	31	64	6	22	48	5	17	40	4	14	32	4	10	32	4	8	32
9				100		500	9	81	81	9	15	81	10	68	50	11	58	39	10	48	30	8	39	72	7	29	63	7	24	63	4	18	36	5	15	45	4	12	36
10							13	100	130	8	83	80	8	76	80	9	67	90	10	58	100	9	48	90	9	38	90	7	31	70	7	25	70	6	21	60	5	17	50
11							100		600	8	91	88	8	84	88	8	75	88	8	66	88	10	58	110	10	48	110	8	39	88	7	32	77	7	28	77	6	23	66
12										3	100	108	6	90	72	6	81	72	7	73	84	8	66	96	9	57	108	9	46	108	8	40	96	7	35	84	6	29	72
13										100		700	6	96	78	6	87	78	6	79	78	6	72	78	8	65	104	9	57	117	8	48	104	7	42	91	7	36	91
14													4	100	56	5	92	70	5	84	70	5	77	70	7	72	98	8	65	112	9	57	126	7	49	98	7	43	98
15													100		800	4	96	60	5	92	75	5	82	75	7	70	105	7	72	105	7	64	105	8	57	120	7	50	105
16																4	100	64	5	94	80	5	87	80	5	84	80	5	77	80	6	70	96	7	64	112	7	57	112
17																100		900	3	97	51	4	91	68	5	89	85	5	82	85	6	76	102	6	70	102	6	63	102
18																			3	100	54	3	94	54	4	93	72	5	87	90	5	81	90	6	76	108	6	69	108
19																			100		1000	3	97	57	3	96	57	4	91	76	5	86	95	4	80	76	5	74	95
20																						3	100	60	2	98	40	3	94	60	3	89	60	4	84	80	5	79	100
21																						100		1100	1	99	21	2	96	42	3	92	63	3	87	63	4	83	84
22																									1	100	22	2	98	44	3	95	66	3	90	66	3	86	66
23																									100		1200	1	99	23	2	97	46	3	93	69	3	89	69
24																												1	100	24	1	98	24	2	95	48	3	92	72
25																												100		1300	1	99	25	2	97	50	2	94	50
26																															1	100	26	1	98	26	2	96	52
27																															100		1400	1	99	27	1	97	27
28																																		1	100	28	1	98	28
29																																		100		1500	1	99	29
30																																					1	100	30
31																																					100		1600

Directions for finding the Average or Mean Life of Railroad Cross Ties.

Find the given year in the Vertical columns numbered 1 to 38 years. Trace along the Horizontal line until you find the given percentage of ties removed up to and including that year. Then trace the Vertical column "A" to the top which will give the Average Life.

For example – From a group of ties 36% were removed after 15 years service. What is the indicative average life of these ties? Answer – 18 years. If 68%? Ans– 24 Yrs.

P = Percentage of ties removed.
A = Accumulated % of ties removed.
T = Tie years in service.

Analysis of Ties with an average life of 20 years.

First Period

1 tie in service 7 Yrs. Under average 13 Yrs. = 13 tie Yrs.
2 ties " " 8 " " " 12 " = 24 " "
3 " " " 9 " " " 11 " = 33 " "
3 " " " 10 " " " 10 " = 30 " "
3 " " " 11 " " " 9 " = 27 " "
3 " " " 12 " " " 8 " = 24 " "
4 " " " 13 " " " 7 " = 28 " "
4 " " " 14 " " " 6 " = 24 " "
4 " " " 15 " " " 5 " = 20 " "
5 " " " 16 " " " 4 " = 20 " "
6 " " " 17 " " " 3 " = 18 " "
6 " " " 18 " " " 2 " = 12 " "
7 " " " 19 " " " 1 " = 7 " "

6 ties made average life of 20 years
57 " or 57% removed at end of 20 years. 280 tie Yrs.

57% of 2000 tie Yrs. = 1140 tie years.
Deduct under average 280 " "
Net made in First Period – 860 " "

Second Period

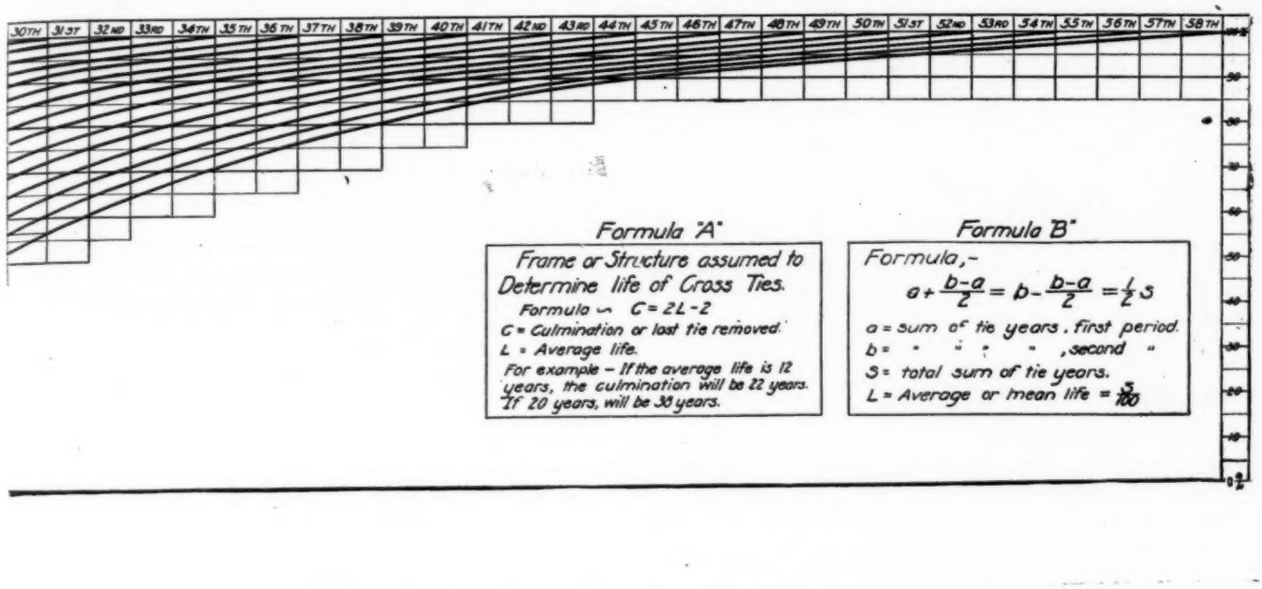
6 ties in service 21 Yrs. Over average 1 Yr. = 6 tie Yrs.
5 " " " 22 " " " 2 Yrs. = 10 " "
4 " " " 23 " " " 3 " = 12 " "
3 " " " 24 " " " 4 " = 12 " "
3 " " " 25 " " " 5 " = 15 " "
3 " " " 26 " " " 6 " = 18 " "
3 " " " 27 " " " 7 " = 21 " "
3 " " " 28 " " " 8 " = 24 tie Yrs.
3 " " " 29 " " " 9 " = 27 " "
2 " " " 30 " " " 10 " = 20 " "
2 " " " 31 " " " 11 " = 22 " "
1 " " " 33 " " " 13 " = 13 " "
1 " " " 34 " " " 14 " = 14 " "
1 " " " 35 " " " 15 " = 15 " "
1 " " " 36 " " " 16 " = 16 " "
1 " " " 37 " " " 17 " = 17 " "
1 " " " 38 " " " 18 " = 18 " "
43 ties or 43% removed at end of 38th year. 280 " "

43% of 2000 tie years = 860 tie years.
Add over average 280 " "
Net made in Second Period–1140 " "

Recapitulation

57% of ties made 860 tie years in First Period
43% " " 1140 " " " Second " "
100% " " 2000 tie Yrs. or average of 20 Yrs.

Likewise the average years 8 to 30 inclusive can be similarly calculated. Under 8 years the formula does not apply on account short period of time in which the ties are removed. (Formula B)


30TH 31ST 32ND 33RD 34TH 35TH 36TH 37TH 38TH 39TH 40TH 41ST 42ND 43RD 44TH 45TH 46TH 47TH 48TH 49TH 50TH 51ST 52ND 53RD 54TH 55TH 56TH 57TH 58TH
Formula "A"
Frame or Structure assumed to Determine life of Cross Ties.
Formula — C = 2L - 2
C = Culmination or last tie removed.
L = Average life.
For example — If the average life is 12 years, the culmination will be 22 years. If 20 years, will be 38 years.
Formula "B"
Formula,-
$a + \frac{b-a}{2} = b - \frac{b-a}{2} = \frac{1}{2}S$
a = sum of tie years, first period.
b = " " " , second "
S = total sum of tie years.
L = Average or mean life = $\frac{S}{100}$

17			18			19			20			21			22			23			24			25			26			27			28			29			30			Ans. Yrs.
P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	P	A	T	Years
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2	2	12	1	1	6	1	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
2	4	14	1	2	7	1	2	7	1	1	7	1	1	7	1	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
3	7	24	3	5	24	2	4	16	2	3	16	1	2	8	1	2	8	2	2	16	1	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
3	10	27	4	9	36	2	6	18	3	6	27	2	4	18	1	3	9	1	3	9	1	2	9	1	1	9	1	1	9	0	0	0	0	0	0	0	0	0	0	0	0	9
4	14	40	4	13	40	3	9	30	3	9	30	3	7	30	2	5	20	1	4	10	2	4	20	2	3	20	2	5	20	2	2	20	1	1	10	0	0	0	0	0	0	10
5	19	55	4	17	44	4	13	44	3	12	33	3	10	33	3	8	33	2	6	22	2	6	22	2	5	22	2	5	22	2	4	22	1	2	11	1	1	11	1	1	11	11
5	24	60	4	21	48	4	17	48	3	15	36	3	13	36	3	11	36	3	9	36	2	8	24	2	7	24	2	7	24	2	6	24	2	4	24	1	2	12	1	2	12	12
5	29	65	4	25	52	4	21	52	4	19	52	3	16	39	3	14	39	3	12	39	3	11	39	2	8	26	2	9	26	2	8	26	2	6	26	2	4	26	1	3	13	13
7	36	98	5	30	70	5	26	70	4	23	56	4	20	56	3	17	42	3	15	42	3	14	42	3	12	42	2	11	28	2	10	28	2	8	28	2	6	28	2	5	28	14
7	43	105	6	36	90	6	32	90	4	27	60	4	24	60	4	21	60	4	19	60	3	17	45	3	15	45	2	13	30	2	12	30	2	10	30	2	8	30	2	7	30	15
7	50	112	7	43	112	6	38	96	5	32	80	5	29	80	4	25	64	4	23	64	3	20	48	3	18	48	2	15	32	2	14	32	2	12	32	2	10	32	2	9	32	16
7	57	119	7	50	119	6	44	102	6	38	102	5	34	85	5	30	85	4	27	68	3	23	51	3	21	51	3	18	51	2	16	34	2	14	34	3	13	51	2	11	34	17
6	63	108	7	57	126	7	51	126	6	44	108	5	39	90	5	35	90	4	31	72	4	27	72	3	24	54	3	21	54	3	19	54	3	17	54	3	16	54	3	14	54	18
6	69	114	6	63	114	6	57	114	7	51	133	6	45	114	5	40	95	4	35	76	4	31	76	4	28	76	3	24	57	3	22	57	3	20	57	3	19	57	3	17	57	19
5	74	100	5	68	100	6	63	120	6	57	120	6	51	120	5	45	100	5	40	100	4	35	80	4	32	80	4	27	80	3	25	60	3	23	60	3	22	60	3	20	60	20
4	78	84	4	72	84	5	68	105	6	63	126	6	57	126	6	51	126	5	45	105	5	40	105	4	36	84	4	31	84	4	29	84	4	27	84	3	25	63	3	23	63	21
4	82	88	4	76	88	4	72	88	5	68	110	5	62	110	6	57	132	6	51	132	5	45	110	5	41	110	4	36	88	4	33	88	4	31	88	3	28	66	3	26	66	22
3	85	69	4	80	92	4	76	92	4	72	92	5	67	115	6	63	138	6	57	138	6	51	138	5	46	115	5	41	115	4	37	92	4	35	92	4	32	92	3	29	69	23
3	88	72	4	84	96	4	80	96	3	75	72	4	71	96	5	68	120	5	62	120	6	57	144	6	52	144	5	46	120	5	42	120	4	39	96	4	36	96	3	32	72	24
2	90	50	3	87	75	3	83	75	3	78	75	4	75	100	4	72	100	4	66	100	5	62	125	5	57	125	6	52	150	5	47	125	4	43	100	4	40	100	4	36	100	25
2	92	52	3	90	78	3	86	78	3	81	78	3	78	78	3	75	78	4	70	104	4	66	104	5	62	130	5	57	130	5	52	130	4	47	104	4	44	104	4	40	104	26
2	94	54	2	92	54	2	88	54	3	84	81	3	81	81	3	78	81	4	74	108	4	70	108	4	66	108	5	62	135	5	57	135	5	52	135	4	48	108	4	44	108	27
2	96	56	2	94	56	2	90	56	3	87	84	3	84	84	3	81	84	3	77	84	3	73	84	4	70	112	4	66	112	4	61	112	5	57	140	4	52	112	4	48	112	28
1	97	29	1	95	29	2	92	58	3	90	87	3	87	87	2	83	58	3	80	87	3	76	87	3	73	87	3	69	87	4	65	116	4	61	116	5	57	145	4	52	116	29
1	98	30	1	96	30	2	94	60	2	92	60	2	89	60	2	85	60	3	83	90	3	79	90	3	76	90	3	72	90	3	68	90	4	65	120	4	61	120	5	57	150	30
1	99	31	1	97	31	1	95	31	2	94	62	2	91	62	2	87	62	2	85	62	3	82	93	3	79	93	3	75	93	3	71	93	4	69	124	4	65	124	4	61	124	31
1	100	32	1	98	32	1	96	32	0	94	0	1	92	32	2	89	64	2	87	64	2	84	64	3	82	96	3	78	96	3	74	96	3	72	96	3	68	96	3	64	96	32
100		1700	1	99	33	1	97	33	1	95	33	1	93	33	2	91	66	2	89	66	2	86	66	2	84	66	2	80	66	3	77	99	3	75	99	3	71	99	3	67	99	33
			1	100	34	1	98	34	1	96	34	1	94	34	1	92	34	2	91	68	2	88	68	2	86	68	2	82	68	3	80	102	3	78	102	3	74	102	3	70	102	34
			100		800	1	99	35	1	97	35	1	95	35	1	93	35	1	92	35	2	90	70	2	88	70	2	84	70	2	82	70	2	80	70	3	77	105	3	73	105	35
						1	100	36	1	98	36	1	96	36	1	94	36	1	93	36	1	91	36	1	89	36	2	86	72	2	84	72	2	82	72	2	79	72	3	76	108	36
						100		900	1	99	37	1	97	37	1	95	37	0	93	0	1	92	37	1	90	37	2	88	74	2	86	74	2	84	74	2	81	74	2	78	74	37
									1	100	38	1	98	38	1	96	38	1	94	38	1	93	38	1	91	38	2	90	76	2	88	76	2	86	76	2	83	76	2	80	76	38
									100		2000	1	98	39	1	97	39	1	95	39	1	94	39	1	92	39	2	92	78	2	90	78	2	88	78	2	85	78	2	82	78	39
												1	100	40	1	98	40	1	96	40	1	95	40	0	92	0	0	92	0	1	91	40	1	89	40	2	87	80	2	84	80	40
												100		2100	1	98	41	1	97	41	1	96	41	1	93	41	1	93	41	0	91	0	1	90	41	1	88	41	2	86	82	41
															1	100	42	1	98	42	1	97	42	1	94	42	1	94	42	1	92	42	0	90	0	1	89	42	2	88	84	42
															100		2200	1	99	43	0	97	0	1	95	43	1	95	43	1	95	43	1	91	43	1	90	43	1	89	43	43
																		1	100	44	1	98	44	1	96	44	0	95	0	1	94	44	1	92	44	1	91	44	1	90	44	44
																		100		2300	1	99	45	1	97	45	1	96	45	1	95	45	0	92	0	0	91	0	1	91	45	45
																					1	100	46	1	98	46	0	96	0	0	95	0	1	93	46	1	92	46	1	92	46	46
																					100		2400	1	99	47	1	97	47	1	96	47	1	94	47	1	93	47	0	92	0	47
																								1	100	48	1	98	48	1	97	48	1	95	48	1	94	48	1	93	48	48
																								100		2500	1	99	49	1	98	49	0	95	0	1	95	49	1	94	49	49
																											1	100	50	0	98	0	1	96	50	0	95	0	0	94	0	50
																											100		2600	1	99	51	1	97	51	1	96	51	1	95	51	51
																														1	100	52	1	98	52	1	97	52	1	96	52	52
																														100		2700	1	99	53	1	98	53	0	96	0	53
																																	1	100	54	0	98	54	1	97	54	54
																																	100		2800	1	99	55	1	98	55	55
																																				1	100	56	0	98	0	56
																																				100		2900	1	99	57	57
																																							1	100	58	58
																																							100		3000	

Directions for finding the Average or Mean Life of Railroad Cross Ties.

Find the given year in the Vertical columns numbered 1 to 58 years. Trace along the Horizontal line until you find the given percentage of ties removed up to and including that year. Then trace the Vertical column "A" to the top which will give the Average Life.

For example — From a group of ties 36% were removed after 15 years service. What is the indicative average life of these ties? Answer — 18 years. If 68%? Ans- 23½ Yrs.

P = Percentage of ties removed.
A = Accumulated % of ties removed.
T = Tie years in service.

of Ties—Copyrighted 1925, by W. F. Goltra.

meagre data we have at hand we do not believe they are getting an *average* life of over 22 years.

In America we are approaching that record if we have not already achieved it. We should be careful, however, not to overstate our achievements in the development of the science of wood preservation. There is no need for any exaggerated statements to demonstrate the results obtained by the great majority of treating plants in this country and the great economy effected by the use of treated ties. The real facts are almost incredible to many people.

We must not lean too far forward or we may lose our balance. Some railroads are reporting such low rates of renewals per mile of road and are ascribing all of the saving to treated ties that we are constrained to believe that they are mistaken in their calculations. For instance, at the last annual convention of the American Railway Engineering Association the committee on Wood Preservation presented a report on the "average annual crosstie renewals per mile of all tracks, 1900 to 1923," covering 20 railroads. In that report the renewals per mile of track in 1923 range from 347 ties on the Kansas City Southern (which we understand was afterwards corrected to 227), down to 91 ties per mile on the Lehigh Valley and 102 ties on the Delaware, Lackawanna & Western. There appear to be some inconsistencies in that report between the "average life" of all ties in track and the number of renewals yearly per mile of track. For instance, the fact that the Lehigh Valley inserted only 91 ties per mile would indicate that the *average life* of all ties on that road is 30 years; and the Lackawanna renewals of only 102 per mile indicate an average life of 28 years, while the New York Central (Lines East), inserted 201 ties per mile during the same year, about double the number on the Lehigh Valley and the Lackawanna, indicating an average life of all ties in track of approximately 14 years. Bear in mind that all three roads began using treated ties about the same time (1910), the ties are creosoted by the same treating company, using the same process and all three roads traverse practically the same territory. Although these roads have been using treated ties for 14 years we believe a large percentage of the ties in the track, principally side tracks and yards, are untreated, the average life of which can hardly be more than 10 years. Also bear in mind that large percentages of *untreated* ties were inserted on all these roads during the last 14 years. Wonderful and amazing as are the results achieved in this country we should guard against exaggeration of the facts. If carried too far one may place a different interpretation to the effect that there was a laxity in maintenance. The writer knows of an old railroad in Ohio having a mileage of main and side tracks aggregating nearly 100 miles, laid with untreated ties. During the past eight or nine years the average yearly renewals per mile of track were only 72 ties, which would indicate that the average life of all the ties in those tracks was nearly 40 years, but that road has filed an application with the Interstate Commerce Commission for abandonment of the line. Thus the low rate of renewals on that road was no indication of the longevity of the ties. With a knowledge of the percentage of untreated and treated ties in the tracks of any railroad one can determine pretty closely the average life of all the ties, and from that determine the quantity required for normal maintenance. And if the quantity inserted falls below that quantity, the deficiency represents under maintenance.

The "Yard Stick"

The longevity of railroad ties, both treated and untreated, is of course, dependent upon a multitude of collateral influences other than preservative treatment, too numerous to mention here. The best illustration of the mortality will be the facts as they occur. The year the ties are put in the track is the starting point; the year in which the first ties fail is another step; the rate from then on is the curve of failure; and the year in which the last tie is removed is the culmination. If all ties were exactly alike in texture, density, soundness, or treatment, all should fail at the same time, but that is never so. The curves in the diagram accompanying this paper illustrate graphically the rate of removals, whether treated or untreated, when their *average life* is between 4 and 30 years. With this diagram and table of percentages, one can readily determine the length of service that can be expected from any group of ties long before they are all removed, for the accumulated percentages of ties removed will show which curve of failure it is following and thus give the mean or average life of the group, which is the essential thing to know.

The *average* life means the useful life; when a tie is removed for any cause, whether on account of decay, mechanical destruction, reballasting, premature removal or for any other cause it is dead, its career is ended and it should be included with the other mortals in calculating the average life of any group of crossties. The proportion of renewals on account of "other causes" than decay is very small anyway, perhaps 5 per cent but not exceeding 10 per cent. Mechanical abrasion is almost entirely due to decay under the rail and around the spike holes. It is the decay of wood which induces "rail cutting" and "spike killing" of ties; with the application of tie plates the destruction can be minimized, but not entirely eliminated.

In 1911 the writer discussed tie renewals in relation to average life and illustrated his paper with a chart and table similar to the one accompanying this sketch, but extending it only to 16 years average life. At that time it was generally supposed that an average life of 16 years was about the limit that could be attained by treating railroad ties. Since then, owing to the great improvement in methods of treatment and quality of materials employed, or in other words, to the scientific development of wood preservation as a whole, many groups of ties show a record of service of 20 years or more; therefore the author found it necessary to lengthen his "yard stick" to include ties with an average life of 30 years.

The "yard stick" is based upon mathematical law, and the rule or formula is that "the average life of crossties is the sum of the tie-years divided by the number of ties." It is upon that law that we have built our diagram of curves and table of percentages. It is the only law upon which the measurement of the longevity of railroad ties can be predicated. No single curve of failure can represent the mean life of all ties with different averages, as was presented by Miss Mable Thorne, then with the Forest Products Laboratory, at the annual meeting of the American Wood Preservers' Association in January, 1918. The curves of failure for different averages are similar to each other but no two are exactly alike. Miss Thorne's single curve of failure is a close approximation of the 16-year curve, but the co-efficient of error increases in both directions from the 16-year curve and the formula is not theoretically applicable to our case. The single curve was obtained by plotting on paper, 42 groups of ties, all having great dissimilarity; no two records could have been anywhere near alike in performance of service and the "curves of failure" obtained for each group must have looked more like a lot of triangles joined together, than uniform curves. From these angular or jagged lines Miss Thorne deduced a single composite curve. She endeavored to discover a *physical* law that was applicable to all kinds of ties and under all conditions. That is

impossible because the physical laws, so far as they relate to crossties, are variable and are influenced by a multitude of things, whereas, on the other hand, the mathematical law is unchangeable, universal and immutable. In a thousand service records no two will show the same physical performance; therefore there can not be any physical law applicable to crossties.

It will be observed that the sum of the percentages of ties removed annually in each curve of failure increases in geometrical progression in the first period and decreases likewise in the second period; that is the mathematical law, and the removals naturally tend towards that goal although some ties may last for a longer or shorter period than the curves of failure would indicate. The "yard stick" is proposed as a standard of measure. It is applicable to all kinds of ties and under all conditions of service. It is unchangeable as it is based on number and duration, that is to say *tie-years*.

Shifting of Load Lessens Shock to Freight

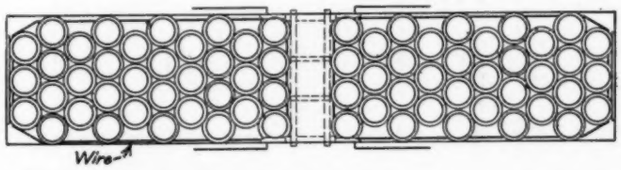
THE use of wire to bind the contents of a freight car together and thereby eliminate bracing has been tried in tests now being conducted by the Western Weighing and Inspection Bureau, Chicago, in co-operation with shippers in that city. With this method the load is allowed to shift slightly in the car and thereby lessen the shock. Better results are obtained since any sudden blow or shock is distributed throughout the contents instead of being concentrated against two or three containers.

Barrelled commodities were used in the tests and the load was divided into two parts, each wired separately

No Damage Occurred When Car Was Bumped at the Rate of 8, 10 and 12 Miles an Hour

and separated by an aisle at the door. Before loading, one No. 8 cold drawn wire was passed around the inside of the car and held in place with staples driven lightly into the wall 10 in. above the floor and two wires were placed 30 in. above the floor, or two above and one below the bulge of the barrels. The barrels were placed in the car on end in one tier and staggered in rows of three and four alternately. When the car was filled to the door the wires were drawn around the barrels by means of a wire-tying machine, thereby pulling the staples from the wall. The force exerted was such that the corner barrels were tilted two inches off the floor. The same method was used for loading the contents of the other end of the car. No bracing was placed in the aisle at the door and the two sections of the load were not fastened to the car at any point. The load was thereby permitted to shift when the car received rough handling.

One of the tests made in co-operation with the Coca Cola Bottling Company, Chicago, on May 8, was on 70 barrels of syrup weighing 640 lb. each. Each section of the load contained 35 barrels, loaded as described above. The car was loaded at the Coca Cola plant and was switched to the North Water street yard of the Illinois Central. At this point the car was inspected and was found to be in perfect condition. The car was then bumped against other cars at the rate of 8, 10 and 12 miles per hour. After this procedure the car was again found to be in perfect condition, as shown in the photo-



Bulkhead Shown Dotted, Eliminated in New Method by Encircling Barrels with Wire as Indicated

graph. The car was then shipped to Kansas City by way of St. Louis and reached its destination without leakage.

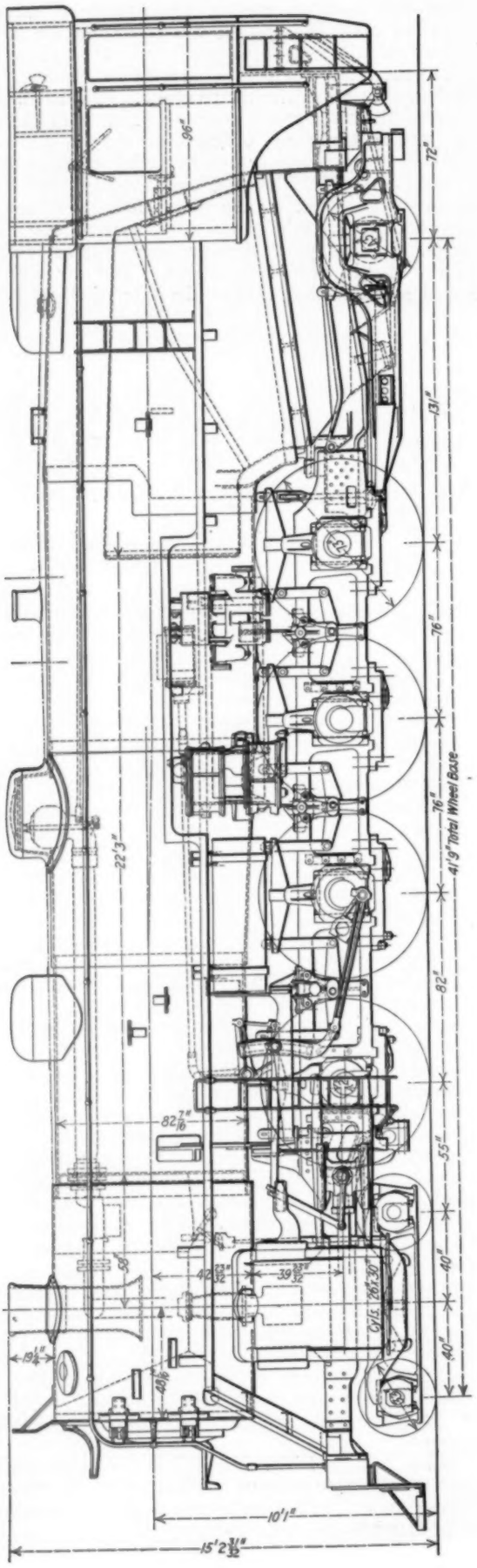
The Coca Cola Bottling Company has approved this method of loading. It reports that the former method of loading requires heavy wooden bulkheads at the center of the car, costing from $5 to $10 a car, while the cost of the wire in the new method is less than $2. In the use of wire no dunnage on bulkheads is charged the shipper. The dunnage amount alone saved by this company on a load from Chicago to Denver, Colo., equals the cost of the wire.

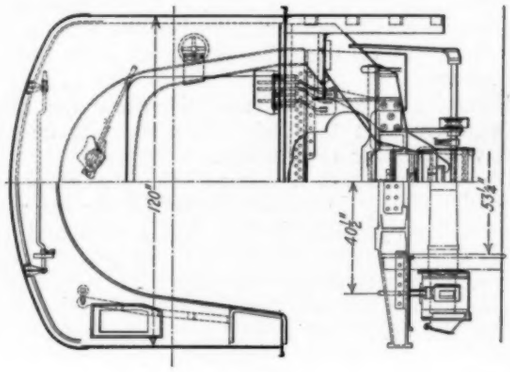
Results obtained in a shipment made by the Corn Products Refining Company, Argo, Ill., on August 3, were equally satisfactory. One car containing 60 barrels of corn syrup weighing 750 lb. each was shipped from Argo to North Water street, Chicago, without damage. Another car was loaded with the same number of barrels and was run against loaded cars while moving at the rate of 16 miles an hour. No leakage resulted from this test although the load shifted 16 in.

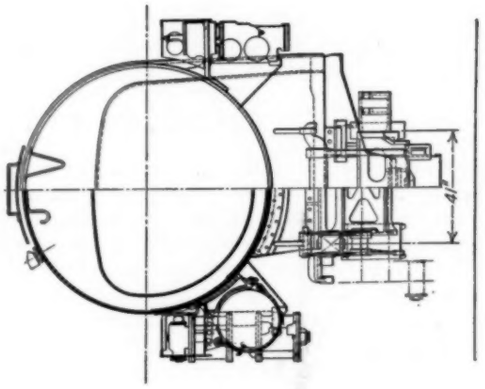
Another shipment from Chicago to St. Louis on June 3 contained 66 barrels of condensed milk weighing 700 lb. per barrel. The milk had been in storage for four years and five barrels were rejected on account of leakage. The sixty-six barrels were loaded in two sections of 26 each with a third section of 14 barrels in a tier above one section. The upper section was separated from the lower tier by boards. The condition of the contents on arrival was perfect, although the load had sifted a total of four inches.

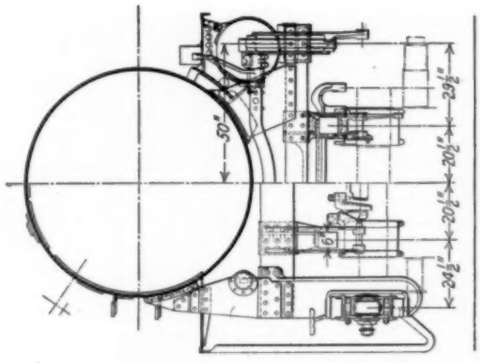
An experiment was tried on a shipment of press print paper in April to determine whether with this method of loading it would be possible to discontinue the practice of lining the car with paper, which lining costs $7 per car. The car was loaded at the plant of the Kimberly-Clark Company, Neenah, Wis., braced in the same way as the barrels and shipped to Chicago without damage.

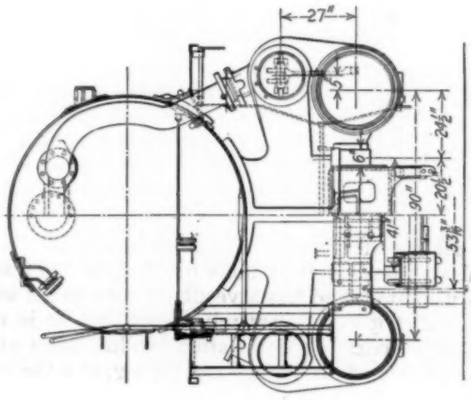
Further tests will be made on barreled commodities to determine the usefulness of the method under other conditions. In addition experiments will be conducted on lighter merchandise.











Elevation and Cross Sections of Mountain Type Locomotive for Use on the Grand Trunk Western Lines of the Canadian National

Mountains Type Locomotive for Use on the Grand Trunk Western Lines of the Canadian National

Mountain Type Locomotive for Canadian National

THE Canadian National has recently received from the Baldwin Locomotive Works, Philadelphia, Pa., five Mountain type locomotives for service on the Grand Trunk Western Lines in the United States. They are built to traverse curves of 18 deg. and while not exceptionally heavy locomotives of their type, are notable examples of this class of power. As they are to be used in United States they are designed and equipped throughout to conform to the Interstate Commerce Commission's requirements.

These locomotives weigh 354,110 lb., of which 231,470 lb. is on the drivers, 61,590 lb. on the front truck and 61,150 lb. on the rear truck. They carry 210 lb. boiler pressure; the diameter and stroke of the cylinders are 26 in. by 30 in. and the driving wheels are 73 in. in diameter. With a maximum cut-off of 85 per cent, they develop a tractive force of 49,600 lb.

The boiler has a straight top, with a maximum diameter, at the rear end of the barrel, of 90 in. The firebox has a combustion chamber 36½ in. long, and contains a brick arch which is supported on four tubes. Flexible staybolts are applied in the breaking zone, with a complete installation in the combustion chamber; while four transverse rows of flexible stays support the front end of the crown sheet. The large flues are electrically welded at the firebox end. The boiler accessories include a Duplex stoker and Elesco feed-water heater.

The steam distribution is controlled by 14-in. piston valves operated by the Walschaert gear. The valves are set with a lead of ¼ in. and a power reverse mechanism is applied. The piston heads are of rolled steel, and the main and side rods of open hearth hammered steel, the main rods having solid back ends with floating bushings. The driving axles and main crank pins are hollow bored.

The main frames are of vanadium cast steel with single front sections, and the Commonwealth rear frame cradle is applied. Self-adjusting driving box wedges are used throughout, and the front driving boxes are of the lateral motion type.

The cab is designed in accordance with Canadian National standards. It is built of steel, wood lined and asbestos insulated, and has a vestibule connection with the tender, so that it can be entirely closed in. It is entered through side doors. Special attention has been given to the arrangement of all fittings and piping, and the comfort and convenience of the crew have been carefully looked after.

The tender is of the Vanderbilt type with cast steel frame and six-wheel trucks. It has a capacity for 18 tons of coal and 11,300 Imperial gallons of water (approximately 13,500 U. S. gallons).

The principal dimensions and data for the locomotives are shown in the following table:

Type of locomotive	Mountain
Service	Passenger
Cylinders, diameter and stroke	26 in. by 30 in.
Valve gear, type	Walschaert
Valve, piston type-size	14 in.
Lead in full gear	¼ in.
Cut-off in full gear, per cent	85
Weights in working order:	
On drivers	231,370 lb.
On front truck	61,590 lb.
On trailing truck	61,150 lb.
Total engine	354,110 lb.
Tender	250,490 lb.
Wheel bases:	
Driving	19 ft. 6 in.
Rigid	12 ft. 8 in.
Total engine	41 ft. 9 in.
Total engine and tender	80 ft. 3¾ in.
Wheels, diameter outside tires:	
Driving	73 in.
Front truck	33 in.
Trailing truck	43 in.
Journals, diameter and length:	
Driving, main	12 in. by 13 in.
Driving, others	10 in. by 13 in.
Front truck	6½ in. by 12 in.
Trailing truck	9 in. by 14 in.
Boiler:	
Type	Straight top
Steam pressure	210 lb.
Fuel, kind	Bituminous
Firebox, length and width	114⅛ in. by 84¼ in.
Height mud ring to crown sheet, back	61 in.
Height mud ring to crown sheet, front	83½ in.
Arch tubes, number and diameter	4
Combustion chamber length	36½ in.
Tubes, number and diameter	40, 5½ in.
Flues, number and diameter	188, 2¼ in.
Length over tube sheets	22 ft. 3 in.
Grate area	66.7 sq. ft.
Heating surfaces:	
Firebox and comb. chamber	280 sq. ft.
Arch tubes	27 sq. ft.
Tubes and flues	3,731 sq. ft.
Total evaporative	4,038 sq. ft.
Superheating	1,048 sq. ft.
Comb. evaporative and superheating	5,086 sq. ft.
Special equipment:	
Brick arch	Yes
Superheater	Yes
Feedwater heater	Yes
Stoker	Yes
Booster	No
Tender:	
Style	Cylindrical
Water capacity	13,500 gal.
Fuel capacity	18 tons

General data estimated:	
Rated tractive force, 85 per cent	49,600 lb.
Cylinder horsepower (Cole)	2,556
Weight proportions:	
Weight on drivers÷total weight engine, per cent	65.33
Weight on drivers÷tractive force	4.66
Total weight engine÷cylinder hp.	138.5
Total weight engine÷comb. heat. surface	69.6
Boiler proportions:	
Comb. heat surface÷cylinder hp.	1.99
Tractive force÷comb. heat. surface	9.76
Tractive force × dia. drivers÷ comb. heat. surface	7.12
Cylinder hp.÷grate area	38.31
Firebox heat, surface÷grate area	4.61
Firebox heat, surface, per cent of evap. heat. surface	7.61
Superheat. surface, per cent of evap. heat. surface	25.92
Comb. heat surface÷grate area	76.2

Southern Passenger Locomotive Makes Record Test Run

WITHIN the past few years the Southern has given considerable attention to long passenger locomotive runs. The culmination of its efforts in this direction was witnessed on May 3 when locomotive No. 6466 left Cincinnati at 8:00 p. m. with train No. 43 and arrived at New Orleans the following afternoon at 8:50 p. m. covering a distance of 836 miles without receiving any mechanical attention at intermediate terminals. The same locomotive left New Orleans on its return trip at 8:30 a. m., May 5, with train No. 44, and reached Cincinnati at 9:30 a. m., May 6, covering a total distance of 1,672 miles on the round trip and arriving at each scheduled stop on time.

Southbound Trip

On the southbound trip the train consisted of 10 cars, Cincinnati to Danville; 11 cars, Danville to Oakdale; 10 cars, Oakdale to Chattanooga; eight cars, Chattanooga to Birmingham, and seven cars, Birmingham to New Orleans, making a total of 7,127 passenger car-miles. The coal consumed on this trip was 60,000 lb., an average of 8.4 lb. per passenger car-mile, and 71.8 lb. of coal per locomotive-mile. The coal used was the same grade furnished locomotives each day in passenger service with the exception of four tons taken at Montlake, Tenn. Three stops were made for coal; first at Stearns, 192 miles, where six tons were taken; second, Montlake, 130 miles south of Stearns, where four tons were taken; third, Akron, 239 miles south of Montlake, where eleven tons were loaded. The locomotive ran from Akron to New Orleans, a distance of 274 miles, and then back to Picayune, 53 miles, or a total of 327 miles, before coal was again loaded.

The fire was not cleaned on the entire trip. The fire was shaken down and the ash pan blown four times between Cincinnati and New Orleans. The fire was still in good condition on arriving at New Orleans.

The locomotive was equipped with a five feed Nathan lubricator with a capacity of five pints of oil. It was refilled at Chattanooga, Tenn., 338 miles from Cincinnati, and again at Meridian, Miss., 295 miles from Chattanooga, averaging 60 miles per pint of valve oil and 25 miles per pint of engine oil.

It was not necessary to pack any cellars or tender trucks en route. The main and middle connecting rod cups were filled at Danville, Ky.; Oakdale, Tenn.; Birmingham, Ala.; Meridian, Miss., and all the rod cups were filled at Chattanooga, Tenn.

Northbound Trip

On the return trip the locomotive left New Orleans on train No. 44 and practically the same record was made as on the southbound trip, except that one more ton of coal was burned. On the return trip the train consisted of seven cars, New Orleans to Birmingham; Birmingham to Chattanooga, nine cars; Chattanooga to Danville, 10 cars; Danville to Cincinnati, nine cars, making a total of 7,035 passenger car-miles, burning 8.8 lb. of coal per passenger car-mile and 74.1 lb. of coal per locomotive mile. Five engine crews handled the locomotive on each trip.

The following are a few of the principal dimensions of the locomotive:

Type of locomotive	Pacific
Service	Passenger
Cylinders, diameter and stroke	24 in. by 28 in.
Weight in working order	232,000 lb.
Driving wheels, diameter	72½ in.
Grate area	54 sq. ft.
Total heating surface	3,065 sq. ft.
Water capacity	8,000 gal.
Fuel capacity	14 tons

The locomotive is equipped with table grates in four sections. The ash pan is 15 in. in depth from the grates to the bottom at the front end; 39 in. at the back end and 8 ft. in length which allows a 24 in. slope in the length of the pan. It is also equipped with an ash pan blower tapped in the boiler below the water level. The pan is blown out by pressure from the boiler.

This test run was made to ascertain the mechanical possibilities of a Pacific type locomotive when making a long, sustained run under normal conditions, but runs of this length have not been regularly established. In actual practice, however, the Southern has made considerable progress in increasing the length of runs, with results as shown in the following table:

LONG LOCOMOTIVE RUNS ON THE SOUTHERN

From	To	Miles	Locomotives now used	Locomotives formerly used
Cincinnati	Jacksonville	840	3	6
Cincinnati	New Orleans	836	3	5
Washington	Atlanta	637	2	4
Chattanooga	Memphis	314	1	2
Rome	Meridian	300	1	2
Atlanta	Columbus	290	1	2
Louisville	St. Louis	274	1	2
Bristol	Chattanooga	242	1	2

SEVENTY BOYS LEFT DETROIT, MICH., recently on an educational trip through the Canadian Rockies on the way to Alaska. Nearly every year George E. Buchanan, of Detroit, once a poor boy, takes a party of boys who have earned one-third of their expenses, about $125, with him to Alaska. The boys earn their one-third by selling pencils, coal baskets—in fact, anything—after school hours. Any boy in any town can participate in this trip yearly. This, Mr. Buchanan contends, gives the boys self-reliance, thrift and responsibility. One-third of the traveling expenses is advanced by the boys' relatives, and the other one-third is provided by Mr. Buchanan and can be paid back by the boys after the trip, thus enabling him to advance the money for other boys. Chambers of Commerce and business men en route will entertain the boys during their trip, as usual.

Large Timber Trestles of the Canadian National Near Edson, Alta.—The Larger Was Built by the Grand Trunk Pacific, and Is No Longer in Use—It Will Be Torn Down

The Utilization of Motive Power

Brief comparison of relative intensity of use obtained with steam locomotives, buses, elevated cars and taxicabs

By Richard Lawrence

IN a discussion of the number of hours of service obtained per locomotive per day, a prominent motive power officer challenged the inference that the motive power department is primarily responsible for the high out-of-service time. He made the point that the average hours awaiting orders is higher than generally supposed, often exceeding four hours. Then there are divisions that have heavy day or night runs. Power arriving at the end of such a period is not needed until the beginning of the next period. In such cases, repairs are handled more economically instead of being hurried. A shorter repair period would gain nothing, except a better "paper" showing.

As an illustration, the case of a local passenger locomotive on a branch line was cited. A southbound run was

This Bus Makes 51,000 Miles a Year and Is in Service an Average of 13 Hours a Day—A Performance Very Largely Fixed by Traffic Conditions

made in the morning and a return run was made in the afternoon. The remainder of the time was spent in charge of a hostler. Repairs were made on Sunday. The total service per day, including preparation, was only six hours. This meant only 25 per cent utilization. Yet from the standpoint of the mechanical department, it was 100 per cent utilization for, at a certain time in the morning, and again in the afternoon, all the assigned power—one locomotive—was in service. The gist of his remarks was that the hours out of service mean nothing unless considered in connection with all the transportation and other factors affecting utilization.

This suggested the thought that the percentage of power in service at the peak load is a truer measure of the work of the mechanical department. The difference between this figure and the average percentage of power in service measures the variation in traffic demands. Efforts were made to measure this difference in a general way. Suburban runs, main line passenger protection, fast freight protection, high percentage of daylight shifting and transfer service, or some similar factor could not be measured accurately, thus casting a doubt on the figures in question.

To develop the thought more clearly, several other forms of transportation were studied, including buses, elevated cars and taxicabs. The mechanical performances found, merit especial attention and should not be dismissed without thought simply because they represent automotive or electric railway performance. The life of elevated cars approximates that of locomotives, and taxicabs reach a life of 150,000 miles, six times that of the average automobile. The relation of the mechanical and average performances measures the traffic characteristics of the different fields. The relation of these fields to certain unprofitable railway fields is very close.

The Chicago Motor Coach Company operates buses on a number of routes in that city. At 5 p. m. every day, they have 98 per cent of their equipment in operation. Every repair that can be finished ahead of that hour is so timed, the result being that only 2 per cent of the equipment is out of service when the peak load is reached. As far as known, this is the best mechanical performance attained in any transportation field. The nature of their traffic, however, limits them to 18 hr. out of 24, the average service being 13 hr. This gives a utilization of 54 per cent. The ratio between 54 per cent and 98 per cent is a measure of the traffic variation and is a matter over which but little control can be effected. The buses average 51,000 miles per year.

The Yellow Taxicabs present a quite different situation. The nature of their service eliminates routes and schedules. The variations are sudden and extreme, rain or fog producing a peak load demand with little or no warning. The repair program, therefore, must be more uniform. At that, only 5 per cent of the cabs are held out for general repairs. Emergency repairs and certain other factors combine to give a maximum utilization of 90 per cent. Strange to say, this peak usually comes at 1 a. m. Sunday morning (Saturday night). Seventy per cent of the cabs are double shifted, the average service being 16.2 hr. This gives a utilization of 67 per cent. It is higher than the bus utilization by reason of the late night (or early morning) demand, a need peculiarly served by cabs. The cabs average 50,000 miles per year and have a life of three years. An accurate cost accounting sets the economical life.

The rush hour service on the elevated lines has been developed to the point where 97 per cent of the equipment is in service. However, the average utilization is only 30 per cent. This is due to the fact that while six-car trains are required during the rush hours, two-car trains during the day and single cars in the midnight hours are sufficient to handle the traffic. The excellence of the mechanical performance would be entirely overlooked if this service were judged by the average utilization of only 30 per cent. But the traffic is determined by business hours and has resisted all efforts to change it materially.

Locomotive utilization runs from 23 to 48 per cent, the

average being 30 per cent. The unproductive time is therefore from 52 to 77 per cent. There is plenty of evidence that the motive power department is not accountable for all of it, but the probability is that it is responsible for the larger part.

That the mechanical department should make every effort to raise its percentage of locomotive utilization goes without saying. Especial attention should be given to the percentages of the newer and more modern power as efforts in that direction have multiplied value. The rapid progress in locomotive design in late years has served to make power obsolete in a few years. More service per year means less loss due to obsolescence. The other problem is the study of "occasional" services. This includes the handling of l.c.l. freight, particularly the collection of l.c.l. freight from a number of branch freight stations. Terminals are "bottlenecks"; terminal expansions are always highly expensive. Services involving low utilization cannot help but be unprofitable. Their elimination serves to better locomotive utilization. A wider spread in the ordering time of yard and transfer runs in the morning also helps. Passenger runs cannot be easily changed, yet a full realization of the cost of an extra locomotive may be a deciding factor. A better traffic utilization and a better mechanical performance both serve to increase the serviceable hours of a locomotive.

The trainmaster and others, as well as the master mechanic, can do a lot to better locomotive utilization. The fellow that "holds the bag" isn't the only man in the game.

Bethlehem Auxiliary Locomotive

THE auxiliary locomotive was first developed on the Delaware & Hudson and was known as the M. & L. tender booster. It was first described in the *Railway Age* of July 22, 1922, page 145, and a later description with test data was published in the *Railway Age*, June 16, 1923, page 1433. Since this time the manufacture of the booster has been taken over by the Bethlehem Steel Company, Bethlehem, Pa., and some changes in its design have been made.

Rear View of Bethlehem Auxiliary Locomotive with the Cover Removed

The truck is a modification of the side equalizer type using a combination of elliptical and helical springs and so arranged as to permit the introduction of jaws, shoes and wedges in a manner similar to locomotive practice. The jaws are closed with binders under the boxes in the usual way and the tender truck axles are equipped with roller bearings. The wheels which were formerly 33 in. in diameter are now 36 in. and the truck bolster is designed to carry 100,000 lb. Due to the engine being carried by the two truck axles with a three point supension, it is entirely independent of the truck frame, permitting great flexibility.

The engine is composed of two cylinders, the diameter and stroke of which has been increased from 10 in. by 10 in. to 10 in. by 12 in., equipped with piston valves driven by a valve motion connected to the main pin of the auxiliary engine. The gear ratio has been changed from 1 to 4.25 to 1 to 2.25. All moving parts work in oil. The lubrication is automatic and requires no attention except to keep the oil in the reservoir at the proper level. The cylinders are designed to work under a pressure as high as 250 lb. per sq. in.

The weight of the auxiliary locomotive is approximately 31,000 lb. and when substituted for the ordinary tender truck, it increases the weight of the tender 10 or 12 tons, depending on the style of the truck removed. The outside crank arm works to a radius of 6 in. and the side rod stresses are low even at relatively high speeds, having an ample factor of safety with 36-in. wheels at 60 miles an hour.

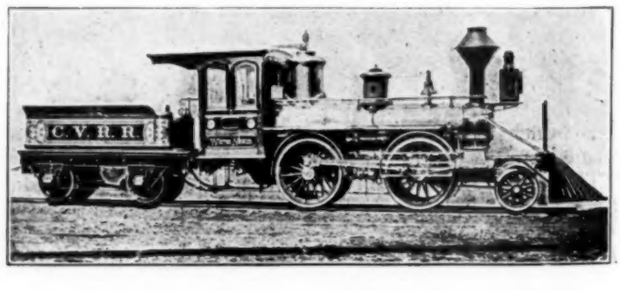
The tractive force of this auxiliary locomotive at seven miles per hour is as follows:

Boiler pressure	Tractive force
185 lb.	13,300 lb.
200 lb.	14,400 lb.
210 lb.	15,100 lb.
220 lb.	15,850 lb.
250 lb.	18,000 lb.

When placing an auxiliary locomotive on a tender it is only necessary to provide a body center plate, control valves, and a simple piping arrangement connecting the steam pipe at the front of the locomotive to the rear tender truck so that superheated steam may be used. After these have been installed the auxiliary locomotive can be substituted as a complete power unit and truck combined, for the ordinary rear tender truck. In event of repairs being necessary, the auxiliary is in a position that is convenient for inspection and by jacking up the rear of the locomotive tender and running the auxiliary out another one can be run in place, the steam line connected up, and the tender dropped into position, the whole being accomplished and the equipment placed in running order in a comparatively short time.

THE VALUE of settlers' effects entering Canada from the United States during the twelve months ending May 31, 1925, amounted to $5,278,945. This compares favorably with the previous year, when settlers' effects had a value of $4,000,118.

SIXTY-NINE THOUSAND HARVEST MEN will be needed to garner the season's crop, according to an announcement of the Canadian Pacific. August 13 is the date set for the first trainload of harvesters from the east to reach Winnipeg, the initial contingent consisting of 9,000 men.



Punch Cards for Bills Receivable

Use of tabulating machines by the Santa Fe in keeping bills receivable sub-ledgers

By M. J. Howell
Accounting Department, Atchison, Topeka & Santa Fe

THE use of the electric tabulating machine and cards for maintaining bills receivable sub-ledgers has recently been begun by the Santa Fe in its disbursements auditing department at Topeka, Kans. Combined with a saving in clerical labor of 40 per cent or more, there have been a number of other advantages, as follows:

(1) Ease and facility in maintaining accounts and obtaining monthly trial balances.

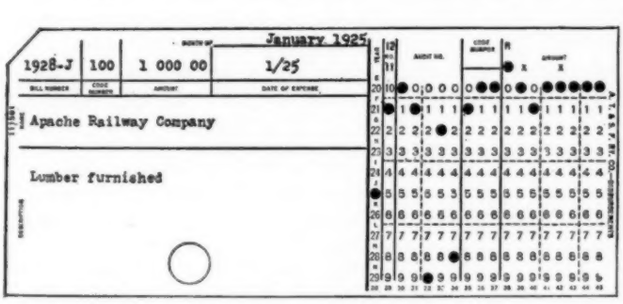
(2) The sub-ledgers are always up-to-date, viz: the posting of bills recorded is done currently instead of following the close of the month's accounts.

(3) The open accounts are segregated into a record where information regarding them may be easily obtained without inspecting a multitude of closed items.

(4) The elimination of duplicate records, such as desk blotters, etc., ordinarily maintained in connection with old style (loose leaf) sub-ledgers to assist in tracing for collections.

(5) The availability of the closed accounts for reference purposes, making it unnecessary to interrupt the operator when securing information.

A card divided into two sections is used. Information is typed in one section for reference purposes and



Sample of Debit Card Typed and Punched from Folio Sheet

the data required for sorting the accounts into alphabetical order and balancing of the account is punched in the space provided on the other section of the card. Cards are then filed in order in separate trays until paid, when they are removed to a closed file to serve as an index. The electric tabulating machine is used to secure totals when desired for any purpose, such as balancing the open accounts with the general ledger, etc.

A more detailed description of the method follows:

Upon receipt of the folios or register sheets from which the postings are made, a separate card is written for each item thereon. The bill number, amount, name, description and date of expense is taken from this source. The code number is secured from a separate table. The information shown on the top line of the typed section is then punched on the card and this punching is machine verified from the folio sheets.

These cards are balanced with the folios by means of the electric tabulating machine and entered on a control sheet in total. They are then sorted by code number and filed in alphabetical order in trays provided for unpaid accounts and fitted with a locked rod to insure against loss or misplacement of cards.

Upon receipt of the treasurer's daily cash sheets the card is withdrawn for each item listed and after being stamped "paid," filed behind the proper guide in the permanent file to serve as an index. If an account is not paid in full an "Unpaid balance card" showing the amount due is inserted in place of the original. Credit cards of selected color are written for all unapplied items. The withdrawn cards are tabulated and the total entered on a control sheet. The net amount after deducting the unpaid balance cards inserted will balance with the treasurer's statement.

When the bill reference has been located on an unapplied item the number is noted on the credit card. Both the credit and the designated offsetting debit cards are periodically withdrawn and the proper entry made on a separate control sheet to insure that the total debit cards withdrawn equal the total credit cards withdrawn.

All forms covering correction or cancellation of bills are passed to the operator currently, who withdraws the cards affected and maintains a record on the control sheets of the aggregate of each transaction. These cards are then kept in a separate file until the accounts are closed when all are withdrawn, tabulated and balanced with the journal entry and the totals on the control sheet. Cards are then withdrawn for bills cancelled or adjusted by other entries affecting the accounts in the general ledger after which all cards are stamped "Cancelled (or corrected) by JE. No. ..... dated ....." and filed as provided above.

As the trays contain the record of all unpaid bills, the amount outstanding in an account may be secured by tabulating the cards. Information desired for tracing or reference purposes, of accounts with other companies may also be easily secured.

When all miscellaneous journal entries and other documents affecting the accounts have been reviewed and the proper adjustments made in the cards, they are in the proper order for tabulating the trial balance, first removing the guides. As the total shown by this operation will represent the open items on the date the balance is taken, the amounts of all folios written and filed for the subsequent month are deducted from, and the applied cash of subsequent month added to, the balance to agree with the general ledger. These reconciliation items are required to prevent overburdening the unapplied cash section.

After the balance has been secured the cards covering accounts paid during the month which have been held in the special hold file are re-sorted into alphabetical order and filed in steel cases, keeping all items for each individual or company together in bill number order by months.

To sort the cards alphabetically by use of the electric sorting machine, a code number is typed and punched in the space provided. The code number consists of three digits, the first representing the first letter, the second the first vowel of the name, and the third digit is used for numbers designating individual companies. Since there

are only five vowels the alphabet may be divided into two groups separated between K and L and designated by numbers substituted for vowels. Numbers 0 to 4 are substituted for vowels with the first group and 5 to 9 for the second. To illustrate, CA 1 becomes 301 and NA 1 becomes 351, etc.

In sorting the cards three sortings are necessary, made in the following order:

1—Third column in field.
2—Second column in field. Cards punched 0 to 4 inclusive, in this column are separated from those punched 5 to 9 inclusive.
3—First column in field on cards punched 5 to 9 inclusive, in second field.
4—First column in field on cards punched 0 to 4 inclusive, in second field.

Each tray contains a series of stop cards and guides marked to serve as indices when looking for information. The sorting by code number places the cards in order for filing of the individual cards behind their proper stop or index card.

Card index trays and posting unit are provided for the storage of cards in open file, and steel cases are provided for those cards which have been closed out.

Guide cards are maintained for both the open and closed files. These conform to the vowel index system, and serve as index as well as separator cards. Individual accounts are indexed on the guide cards and the accounts are separated by means of green stop cards properly labeled to show the account following.

By use of the color scheme applied to different ledger accounts the same operator is able to maintain two or more at the same time without confusion.

Accident Investigations---October, November and December

THE Interstate Commerce Commission has issued its quarterly summary of accident investigations (No. 22), for the three months ending with December, 1924.*

This bulletin covers 16 collisions, seven derailments and one fire, as follows:

TRAIN ACCIDENTS INVESTIGATED—OCTOBER, NOVEMBER AND DECEMBER, 1924.

1091.	Galveston, H. & S. A.	Noonan, Tex.	Oct. 3	C
1092.	Baltimore & Ohio	Aviston, Ill.	Oct. 3	D
1093.	Missouri Pacific	Swifton, Ark.	Oct. 4	D
1094.	Delaware, Lack. & W.	New Milford, Pa.	Oct. 13	C
1095.	International	Tonawanda, N. Y.	Oct. 19	C
1096.	Portland Elec. P. Co.	Ashdale, Oreg.	Oct. 19	C
1097.	Pennsylvania	Steubenville, O.	Oct. 21	D
1098.	Texas & Pacific	Eastland, Tex.	Oct. 23	C
1099.	Lehigh Valley	Aldene, N. J.	Nov. 11	C
1100.	Florida East Coast	Wabasso, Fla.	Nov. 14	D
1101.	Baltimore & Ohio	Weverton, Md.	Nov. 15	D
1102.	Missouri Pacific	Syracuse, Mo.	Nov. 17	C
1103.	Michigan	Frankenmuth	Nov. 29	C
1104.	Central of N. J.	Jersey City	Nov. 29	C
1105.	Pennsylvania	Chicago, Ill.	Dec. 1	C
1106.	Chesapeake & Ohio	Westham, Va.	Dec. 1	D
1107.	Mobile & Ohio	Jackson, Tenn.	Dec. 2	C
1108.	Detroit United	Wyandotte, Mich.	Dec. 3	F
1109.	Key System	Oakland, Calif.	Dec. 4	C
1110.	Norfolk & Western	Lofton, Va.	Dec. 7	C
1111.	Chicago & N. W.	Chicago, Ill.	Dec. 14	C
1112.	M., St. Paul & S. S. M.	Chip'wa Fa., Wis.	Dec. 20	D
1113.	Seaboard Air Line	Plant City, Fla.	Dec. 29	C
1114.	Chicago Junction	Chicago, Ill.	Dec. 30	C

Abstracts of Reports

Galveston, Harrisburg & San Antonio, Noonan, Tex., Oct. 3.—Westbound extra freight 764, moving at about 15 miles an hour, collided with eastbound extra freight 759, which was moving at about 25 or 30 miles an hour; and ten cars were wrecked. The engineman of the eastbound train was killed as was also the conductor of the same train, who was riding on the locomotive. Two other employees were injured. Operator Crouch, at Hondo, 18 miles west of Noonan, failed to deliver the meeting order to 759. The collision occurred at 9:26 a.m. The order had been sent to Hondo before Crouch came on duty. Night Operator Huff had made no entry of the order on the transfer book. The operator's copy of the order was on the file hook with others but the copies intended for 759 could not be found. Operator Huff could not say what had become of them; the porter had emptied the waste basket and burnt its contents. The dispatcher is held responsible for having allowed Crouch to clear 759 on another order. The dispatcher had signed the transfer book showing that this order was outstanding, but when 759 reached Hondo he was endeavoring to complete an order over the telephone to a conductor at another station and forgot that the order for 759 was still outstanding. The men in charge of the westbound train were held at fault for not having stopped at an automatic signal (a station signal) approaching Noonan, the rule requiring that the train should have proceeded only under the protection of a flag; but it is doubtful whether compliance with this rule would have averted the collision. An adequate block signal system would probably have prevented this collision.

Baltimore & Ohio, Aviston, Ill., Oct. 3, 10:47 p.m.—Eastbound passenger train No. 12, moving at about 50 miles an hour, was derailed by running over a misplaced switch, and the locomotive and one coach were overturned. The engineman was killed and the fireman seriously injured; and one other employee and 15 passengers were injured. The switch had been set for the side track and latched; and the switch lamp extinguished. A negro who was subsequently arrested confessed to the crime and to having filed off the lock. The same man had committed similar offences before.

Missouri Pacific, Swifton, Ark., Oct. 4, 10:30 p.m.—Northbound passenger train No. 8, moving at about 55 miles an hour, was derailed by a misplaced switch, and the train was driven against a number of freight cars standing on the side track. The locomotive was overturned and two baggage cars were wrecked, as were some of the standing freight cars. The engineman, the fireman and one trespasser were killed and 31 persons were injured. The switch had been opened apparently with malicious intent. The switch light had been observed to be burning properly up to within a few minutes of the time when the derailment occurred, and it is possible that the person who opened the switch did so, and also extinguished the lamp, just before the train reached it. The switch lock was not damaged, indicating that the person who opened the switch had been in possession of a switch key.

Delaware, Lackawanna & Western, New Milford, Pa., October 13, 5:12 a.m.—An eastbound freight train with a pushing engine at the rear, moving at about 15 miles an hour, was run into by eastbound passenger train No. 14, moving at about 40 miles an hour or faster, wrecking the first car of the passenger train and several cars in the

*Quarterly No. 21 was noticed in the *Railway Age* of March 21, 1925, page 799; No. 20 in the issue of October 25, 1924, page 759.

freight. The engineman and fireman of the pushing engine and the flagman of the freight were killed, and 12 passengers and 5 employees were injured. The passenger train had passed two automatic signals set against it. There was a dense fog, and the engineman called the cautionary signal, saying "green," but the fireman responded that he could not see the signal, and the engineman (according to his own statement), then shut off steam; but nevertheless he passed the stop signal without seeing it. The flagman of the freight knew that the passenger train was nearly due yet he did not go back, and the conductor made no attempt to require him to do so; neither were any fusees thrown off. The flagman of the pushing engine is held to be open to criticism for his failure to show more interest in the protection of the train. The investigation disclosed some conflicting views as to whether the flagman of the train or the one on the pusher should do the flagging in such a situation. The general superintendent testified that the duty devolved on the train flagman, yet there is a rule which seems to imply that when a pushing engine has a flagman he will be the one to do the flagging. The report makes the usual comment, that an automatic train stop could have prevented the collision.

International, Tonawanda, N. Y., Oct. 19.—Rear collision of electric cars, three cars in each train, due to failure of motorman, running at high speed, to keep a proper lookout; 4 passengers killed, 96 injured. This collision was reported in the *Railway Age* of November 22, page 962.

Portland Electric Power Co., Ashdale, Oregon, October 19.—Collision between a southbound repair car, running as an extra, and a northbound passenger train (consisting of a single car) damaging both cars and causing the injury of six employees. Train movements on this line are governed by automatic signals operated by trolley contact switches; and the motorman of the passenger train is held responsible for having failed to properly observe the rules and indications of the signal system. Speed limit rules were also disobeyed, and such disobedience is found to have been somewhat common.

Pennsylvania, Steubenville, Ohio, October 21.—A westbound freight train, consisting of a locomotive and eleven cars, was derailed by reason of excessive speed, and the fireman and one brakeman were killed. The locomotive was moving backward and the speed was about 25 or 30 miles an hour. (One observer estimated the speed at 50 miles an hour). No serious defect was found in the engine or the track, though the absence of swash plates in the tender may have been responsible for too much surging of the water. The rules forbid running of engines of this type—2-8-0—faster than 25 miles an hour.

Texas & Pacific, Eastland, Tex., October 23.—Westbound freight, Extra 389, switching on the main line, within yard limits, was run into by eastbound freight, Extra 520, which approached with speed not under control; and both engines were badly damaged. A dozen cars were wrecked and the engineman of 389 was killed. Two other employees were injured. The trains had orders to meet at Eastland. The engineman of 520 is held responsible for not bringing his speed under control within yard limits, but the other engineman also had moved from side track to the main line without keeping a proper lookout. A speed recorder on engine 520 showed that a rate of 35 miles an hour, much higher than the rule permits, had been kept up for considerable distances.

Lehigh Valley, Aldene, N. J., November 11, 4:40 a.m. —An eastbound freight train moving at about 10 miles an hour was run into at the rear by a following freight, moving at considerable speed; and the flagman of the leading train was killed. The atmosphere was somewhat misty, but not such as seriously to obscure signals. The second train had run past two automatic block signals set against it. The engineman had been trying to close the rear door of the cab, when he passed the distant signal; and when he passed the home signal he was standing with his back to the boiler to dry his clothing; but the inspector finds that there was nothing to hinder him from keeping a good lookout if he had taken care to do so. There is no assurance that the throwing off of a fusee from the leading train would have prevented the collision.

Florida East Coast, Wabasso, Fla., November 14.—Southbound passenger train No. 29 derailed by a loose tire; four passengers killed, 16 injured. This accident was reported in the *Railway Age* of February 7, page 383.

Baltimore & Ohio, Weverton, Md., November 15.—Westbound passenger train No. 5 (The Capitol Limited) moving at high speed was derailed by running through a No. 8 crossover, and the engine and first car were overturned. The fireman was killed and eight other persons were injured. Approaching this crossover the train passed a distant signal at caution and a home signal with the high arm at stop and a calling-on arm at caution. This calling-on arm covers movements to all routes, and it is used to slacken the speed of trains to receive orders; and the engineman, seeing a man on the ground with an order, assumed that the delivery of the order was the only hindrance to his proceeding at full speed, this signal having never been used to divert this train to the crossover; consequently he did not reduce speed sufficiently to pass through the crossover in safety. This is the statement of the engineman; who also protested that the distant signal ought to have been at caution, as would be the practice at certain other interlocking plants. However, he is not excused on this ground; and moreover, although the engineman claims to have applied the brakes the speed recorder on the locomotive and also another recorder on a car at the rear of the train, indicated a speed of 48 miles an hour when the train entered the crossover; and the recorders did not show any reduction in speed in the vicinity of the distant signal. The passenger train was being diverted from its regular track because of the derailment of a freight train a short distance west of Weverton. The report of this derailment says that freight trains are required to clear the time of train No. 5 by 30 minutes.

Missouri Pacific, Syracuse, Mo., November 17.—Eastbound passenger train No. 20, second section, moving at from 13 to 40 miles an hour, collided with westbound passenger train No. 13 which was standing on the main track expecting the eastbound train to enter the siding. It did not do so, and both locomotives and three cars were badly damaged in the collision. The engineman of the westbound train was killed and 35 passengers and four employees were injured. The engineman of the eastbound train is held responsible. He sounded the proper whistle signals approaching Syracuse but did not apply the brakes at the mile-board as required by rule. At the hearing, this engineman said he had found, after the collision, that the angle cock on the forward end of the first car was partly closed; but he had not reported this to his superiors, and the evidence indicates that, in conversation with some of his fellow employees, he had admitted that the responsibility for the collision was his. The conclusion of the report is, simply, that he did not begin braking soon enough.

Michigan Railroad. Frankenmuth Junction, Mich., November 29.—Collision between northbound passenger train No. 157, second class, and southbound passenger, No. 22, each train consisting of one electric car; the motorman of No. 22 was killed and 22 passengers and 2 employees were injured. The southbound train had disobeyed a meeting order but, the motorman having been fatally injured, the inspector can find no definite reason

for his failure to stop at the appointed meeting place. The conductor of this train says that he tried to attract the attention of the motorman to the fact that he was over-running the meeting point, but the inspector finds no confirmatory evidence of such action by the conductor. The report recommends the adoption of the rule, commonly in use on steam railroads, requiring the conductor to give a special signal to the motorman on approaching a meeting point.

Central of New Jersey, Jersey City, N. J., November 29.—Collision, on yard tracks, between runaway and standing freight cars. One person killed and one injured. The runaway cars had broken away from a train moving up grade because, apparently, of too much difference in the height of the couplers, where the grade of the road changed abruptly from four per cent to level. The inspector says that as this draft of cars was to be moved a short distance on the main line a proper regard for safety should have prompted the use of the air brakes. Such use is now required, in instructions issued since this accident.

Pennsylvania, Englewood, Ill., December 1.—Rear collision of passenger trains, causing the death of one passenger and the injury of 19 passengers and three trainmen. This collision, due to disregard of signals was reported in the *Railway Age* of January 31, page 324.

Chesapeake & Ohio, Westham, Va., December 1.—Westbound freight train No. 95 moving at about 25 miles an hour was derailed at a partly open switch and the locomotive was overturned. The wreck fell partly upon the eastbound track and the locomotive and eight cars of an eastbound freight train were derailed, the locomotive being overturned. The engineman and fireman of this train were killed and three other employees were injured. The inspector finds that the switch had been maliciously loosened. The light was left so as to show green (clear).

Mobile & Ohio, Jackson, Tenn., December 2, 5:44 a.m.—Southbound freight train No. 33, moving slowly, approaching a crossing, was run into at the rear by southbound passenger train No. 3; the caboose of the freight was wrecked and the conductor and the flagman of the freight were killed. These two men, knowing that they were close to the time of the passenger train, are declared to have been responsible. The engineman of the freight claimed that he had a reasonable prospect of reaching Jackson station five minutes before the passenger train would be due, but the inspector does not accept this claim. All that had been done at the rear of the freight to protect it was the placing of a burning fusee on the rear end of the caboose. The collision occurred within the limits of the city of Jackson, and the city requires all trains to run at six miles an hour or slower; had the passenger train obeyed this rule, the collision, undoubtedly, would have been prevented. An officer of the road said that this city speed limit was not observed except at highway crossings and in the more densely populated part.

Detroit United, Wyandotte, Mich., December 3.—A southbound electric train of two cars struck an automobile truck on a highway crossing. Turpentine from the truck set fire to the leading car and the motorman was killed. Four passengers were also killed and ten were injured. The inspector finds that the man in charge of the automobile drove upon the railroad directly in front of the approaching train. He was moving at about twelve miles an hour. This driver was familiar with the crossing and is held to be at fault for not approaching cautiously.

Key System, Oakland, Cal., December 4.—Rear collision of passenger trains, seven passengers and two employees killed; 26 passengers and two employees injured. Train No. 15 ran into the rear of train No. 729 because of the failure of the motorman to heed automatic block signal indications; also because No. 15 was running so fast that the automatic train stop had not enough space in which to apply the brakes effectively. This collision was reported in the *Railway Age* of March 7, page 571.

Norfolk & Western, Lofton, Va., December 7.—Southbound extra freight train 1145 moving at about 20 miles an hour, ran into the rear of a preceding freight, wrecking the caboose and overturning both of the two locomotives of train 1145. One fireman was killed and two other employees were injured. The leading train had signaled, by fusee, to the following train but this signal was not heeded. The engineman of the second engine of 1145 is held also blameworthy for taking no action toward stopping the train when he knew that the rule was being violated. Also, all employees on both engines were censured for not keeping a proper lookout while descending a steep grade (1.6 per cent). The engineman and fireman of the leading engine had ignored Rule 34 requiring them to communicate with each other when they saw the fusee. It was found that trains had been moved down this grade habitually without the use of retainers.

Chicago & N. W., Chicago, Ill., December 14.—Rear collision of eastbound freight trains, wrecking a caboose and one car; conductor killed, one trainman injured. The leading train had been stopped some distance short of the home signal (where two main tracks converge) with the rear end of the train about 25 ft. east of the distant signal; and the conductor and rear brakeman are held responsible, having taken no measures to protect their train. The engineman is also censured for not sounding the whistle, as a notice to the flagman to go back. The train had been standing about seven minutes prior to the moment of collision. The track on which the train was standing is not protected by block signals. The superintendent averred that the distant signal, being in the caution position, required the approaching train to run with speed under control; but the rule gives to this signal no function except that of an approach signal for the home signal, which is about one mile in advance.

Minneapolis, St. Paul & Sault Ste. Marie, Chippewa Falls, Wis., December 20.—Eastbound passenger train No. 2 was derailed at a loose switch and one car fell into the Chippewa River; eight passengers killed and five passengers and two employees injured. This derailment was reported in the *Railway Age* of January 31, page 324.

Seaboard Air Line, Plant City, Fla., December 29, 11:15 p.m.—Rear collision of northbound freight trains, train No. 480 running into the rear of Extra 328, and wrecking the caboose. The fireman and a brakeman on the locomotive of No. 480 were killed and two other train men were injured. The report gives the cause of the collision as failure to observe Rule 93 within yard limits. The engineman tried to excuse himself by the plea that the marker lights on the leading train were burning very dimly or not burning at all, and that the headlight on his locomotive was defective; but the rule required that within yard limits, he should move slowly enough to be able to stop within one-half the distance that he could see a clear track. The claim about the headlight was that it was badly out of focus and that this condition had existed for several weeks; but no report had been made of the defective condition.

Chicago Junction, Chicago, Ill., December 30, 4:30 a.m.—A westbound freight of the Illinois Central, moving at very low speed, ran into the rear of a preceding freight, also of the Illinois Central, and the conductor of the leading train was killed; one employee also injured. This collision occurred under the wide bridge at Fortieth street and Stewart avenue where smoke and steam do not rise freely and where, consequently, the view is not good. The inspector finds the cause of the collision to have been the failure to run with speed under control under adverse circumstances on a descending grade.

General News Department

The Brotherhood Investment Company, a subsidiary of the Brotherhood of Locomotive Engineers, has purchased 27,000 acres of land on the Gulf of Mexico seven miles south of Sarasota, Fla.

Georgia seems likely to be the next state to enact a law requiring automobiles to be brought to a stop before being driven across a railroad. The two houses of the legislature have passed bills designed to provide such a law. Both of the bills are characterized by rather crude provisions, but there is said to be a strong sentiment in favor of getting together and laying a completed law before the governor at an early date.

A reception to the neighbors would appear to be a proper name for the arrangements effected at the division terminal of the Louisville & Nashville at Etowah, Tenn., on August 3; about 600 people visiting the shops of the company at that place on the invitation of the officers of the road. This was adopted as one of the ways in which to take the public into their confidence. From 9 a. m. until 3 p. m. guides conducted parties of visitors through the shops every 30 minutes.

The Interstate Commerce Commission, by an order dated July 21, has authorized the Illinois Central to install automatic train control on its road between Waterloo, Iowa and Fort Dodge, 100 miles, instead of installing on a division between Chicago and Memphis as was called for by the Commission's order of January 14, 1924. This action was taken by the commission on condition that the order shall not result in extending the time within which the order shall be complied with, namely February 1, 1926. The road also must agree that the amendment does not entitle it to claim, in court or elsewhere, any extension of time beyond February 1, 1926.

A Thirty-Story Office Building at the Grand Central Terminal

The New York Central has leased to "Eastern Offices, Incorporated," the rights above the railroad level, of the block between 43d and 44th streets, New York (east of the Grand Central Terminal and north of the Commodore Hotel) for the construction of what is to be "the world's largest office building"; 30 stories high and with 1,350,000 sq. ft. of rentable office space. The building will cost about $19,000,000, and will measure 21,000,000 cu. ft. It will rest on a seven-story sub-structure extending 80 ft. below the level of Lexington avenue. This lower part will be utilized by the railroad company. Todd-Robertson-Todd Engineering Corporation will build the structure under the supervision of Sloan & Robertson, architects, who have designed floors of several different sizes, ranging from 20,000 to 68,000 sq. ft.

Master Blacksmiths' Convention to Be Held in Cleveland

The twenty-ninth annual convention of the International Railroad Master Blacksmiths' Association will be held at the Hotel Winton, Cleveland, Ohio, August 18, 19 and 20. An exceptional program for this convention has been arranged, including committee reports on such subjects as autogenous welding, drawbars and drawbar pins, and reclamation. An additional feature of the convention will be the second exposition and demonstration of forging machinery and bolt equipment at the plant of the National Machinery Company, Tiffin, Ohio. August 21 has been set aside at the exposition as Master Blacksmiths' day, and special arrangements have been provided for transportation of the members of the association and their guests between Cleveland and Tiffin on that day. Special arrangements have been made for inspection trips to the plants of the Ajax Manufacturing Company and the Acme Machinery Company. There will also be an exhibit of blacksmith shop equipment under the supervision of the Supply Men's Association all during the convention. The following is a list of subjects that are to be discussed before the convention: Autogenous welding; carbon and high speed steel; drop forging; drawbars and drawbar pins; frame making and repairing; heat treatment of steel and iron; reclamation; spring making and repairing, and tools and formers.

Northwestern May Enter St. Louis

Acquisition of an entrance to St. Louis, Mo., is contemplated by the Chicago & North Western. The matter will be considered by the board of directors at its regular meeting in September. The proposal is to take over the line of the Litchfield & Madison under a lease which will provide also for the use of the line of the Alton & Eastern, which is under the same ownership as the Litchfield & Madison, from Madison, Ill., into St. Louis. A short connecting link approximately seven miles long will be built from Benld, Ill., the southern terminus of the North Western's southern Illinois line, to Mt. Olive, at the northern end of the Litchfield & Madison. The plans provide for the use of the St. Louis line for freight service only.

Report on Hackettstown Derailment

The Interstate Commerce Commission has issued a report, signed by W. P. Borland, director of the bureau of safety, on the disastrous derailment of a passenger train on the Delaware, Lackawanna & Western near Hackettstown, N. J., on June 16, when 50 persons were killed—45 passengers, one sleeping car porter and four employees—and 23 persons were injured. The rear brakeman was the only survivor of the train crew.

This derailment was reported in the *Railway Age* of June 20, page 1537. The inspector examined numerous witnesses as to how much rain had fallen during the night immediately preceding the disaster, but got little definite information. The section foreman knew that there was considerable rain about 1 a. m. but did not consider it heavy enough to warrant going out to examine the roadway.

The highway crosses the railroad at an angle of 90 degrees. On the south side, the side from which the gravel was washed upon the track, the highway is level for about 100 ft. back; and back of that it descends toward the railroad at about 9 per cent. The crossing planks are about 3 in. in thickness and the flangeway is 2½ in. wide. The gravel which threw the locomotive off the track was from four to six inches deep over the rail. The roadmaster testified that at a similar crossing, 600 ft. west of this one, no trouble was experienced. There was nothing to indicate that the boiler of the locomotive had exploded. The operator at Washington said that the headlight of the locomotive, when it passed that station, was burning properly.

The inspector, in his conclusions, said that the earth and stones which were washed on to the track came from the traveled part of the highway (not the ditches). No difficulty had been experienced at this crossing within the past 25 years.

Canadian Political Campaign Concerned with Railway Issue

With the approach of a general federal election in Canada speakers at gatherings in various parts of the country are making references to the Canadian National and to the report of the special Senate committee last session which urged a consolidation of the Canadian Pacific and Canadian National for purposes of administration and operation. For ten days Arthur Meighen, leader of the Conservatives, has been touring the province of Manitoba, and referred to a speech made in Quebec province a

(*Continued on Page* 332)

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR, 1925

Name of road		Average mileage operated during period.	Operating revenues			Operating expenses						Net from railway operation.	Operating income (or less).	Net after rents.	Net after rents, 1924.
			Freight.	Passenger.	Total (inc. misc.)	Maintenance of Way and structures.	Maintenance of Equipment.	Traffic	Transportation.	General.	Total.				
Akron, Canton & Youngstown	June	171	$261,189	$414	$271,532	$34,247	$25,788	$10,225	$66,721	$14,491	$146,186	53.80	$125,346	$112,006	$72,926	$23,084
	6 mos.	171	1,419,122	2,733	1,487,656	205,905	151,679	64,800	403,145	70,285	890,515	59.90	597,141	516,970	313,184	284,034
Alabama & Vicksburg	June	141	201,588	54,269	278,632	41,427	46,923	9,991	94,727	13,934	208,155	74.70	70,477	43,689	48,686	34,159
	6 mos.	141	1,241,160	329,972	1,700,422	225,988	288,421	60,196	571,905	86,572	1,231,946	72.50	465,476	300,459	335,233	228,741
Vicksburg, Shreveport & Pacific	June	188	246,830	63,607	331,671	54,024	56,979	11,470	118,615	13,702	256,256	77.30	75,415	50,864	43,295	27,696
	6 mos.	188	1,447,391	373,779	1,955,215	325,477	332,246	70,431	735,817	94,757	1,570,358	80.30	384,857	248,467	216,643	164,886
Ann Arbor	June	293	415,203	24,576	458,639	69,098	89,589	11,210	175,619	18,385	363,904	79.30	94,735	73,788	67,973	38,046
	6 mos.	293	2,468,642	157,503	2,724,357	247,287	519,636	61,869	1,124,219	93,840	2,046,854	75.10	677,503	563,283	471,100	223,419
Atchison, Topeka & Santa Fe	June	9,186	10,460,384	4,015,011	15,720,552	2,797,442	3,193,728	344,588	4,911,330	418,551	11,641,699	74.10	4,078,853	2,982,271	2,939,220	1,770,169
	6 mos.	9,184	60,840,557	19,784,395	88,191,009	13,565,368	20,024,435	2,041,844	29,570,378	2,369,203	67,445,760	76.50	20,745,249	14,061,770	13,837,459	11,792,218
Gulf, Colorado & Santa Fe.	June	1,908	1,891,832	274,696	2,293,094	573,050	511,282	52,243	731,763	69,902	1,934,766	84.40	358,328	269,404	118,934	23,890
	6 mos.	1,908	11,127,363	1,589,277	13,490,461	3,076,170	3,095,029	302,873	4,357,115	403,351	11,228,868	83.20	2,261,593	1,736,251	944,762	—90,201
Panhandle & Santa Fe	June	858	562,718	97,568	711,669	148,343	166,760	9,810	222,944	22,496	569,540	80.00	142,129	119,745	64,957	—74,354
	6 mos.	858	3,793,097	634,073	4,720,965	939,149	1,086,471	52,190	1,440,298	115,876	3,630,644	76.90	1,090,321	925,895	602,724	264,664
Atlanta & West Point	June	93	137,470	73,636	242,337	32,345	41,166	10,415	87,730	10,560	187,684	77.40	54,653	41,804	35,353	10,964
	6 mos.	93	891,888	415,844	1,505,108	184,494	267,367	61,062	566,431	62,646	1,172,581	77.90	332,527	242,836	179,527	140,943
Western of Alabama	June	133	160,441	64,451	248,684	32,366	46,870	10,813	75,188	10,597	180,716	72.60	67,968	53,037	55,538	27,084
	6 mos.	133	1,068,982	384,227	1,608,139	210,118	301,665	65,612	482,460	63,228	1,150,650	71.50	457,489	361,742	339,294	277,626
Atlanta, Birmingham & Atlantic	June	639	307,207	42,105	378,738	80,940	90,529	23,105	158,100	17,448	370,183	97.70	8,555	—5,093	—23,167	—19,757
	6 mos.	639	2,143,088	227,569	2,561,264	498,014	574,908	139,133	1,031,806	100,567	2,344,798	91.50	216,466	137,251	—24,527	9,170
Atlantic Coast Line	June	4,887	4,905,406	1,277,545	6,706,368	942,064	1,410,399	140,192	2,302,525	163,178	4,976,365	74.20	1,730,003	1,229,220	1,052,328	869,281
	6 mos.	4,880	33,569,558	10,624,234	47,780,180	5,339,850	8,433,245	847,337	15,697,359	936,335	31,556,643	66.00	16,232,537	13,172,921	11,774,529	10,707,777
Charleston & Western Carolina	June	342	289,789	25,158	329,516	58,372	40,827	7,496	118,678	6,214	231,586	70.30	97,930	77,885	63,060	12,263
	6 mos.	342	1,914,754	150,152	2,158,264	355,087	256,711	43,925	840,077	40,071	1,535,852	71.20	622,412	502,052	395,494	178,604
Baltimore & Ohio	June	5,292	15,165,737	2,411,996	18,886,498	2,150,253	4,439,868	385,069	6,593,931	526,364	14,276,478	75.60	4,610,020	3,762,955	3,338,604	3,142,666
	6 mos.	5,292	89,102,236	13,152,009	109,788,459	12,903,433	26,785,217	2,266,544	40,813,441	3,101,254	86,843,684	79.10	22,944,775	17,860,787	15,718,412	15,767,477
Baltimore & Ohio Chicago Term.	June	80	.....	.....	311,654	44,322	29,696	1,914	166,261	10,206	257,403	82.60	54,251	11,425	106,624	12,844
	6 mos.	80	.....	.....	1,753,513	219,212	213,621	11,531	996,879	64,782	1,533,340	87.40	220,173	—24,585	536,446	—25,985
Staten Island Rapid Transit	June	23	97,494	131,574	262,978	44,292	32,088	2,481	121,492	15,222	215,575	82.00	47,403	31,321	14,935	—14,536
	6 mos.	23	577,362	647,229	1,368,125	258,811	187,905	12,005	742,811	87,186	1,288,718	94.20	79,407	—14,766	—105,990	—120,555
Bangor & Aroostook	June	616	370,922	40,398	438,979	106,430	103,240	4,238	134,237	22,901	373,314	85.00	65,665	27,257	54,216	6,557
	6 mos.	616	3,363,632	347,198	3,869,285	641,942	702,505	29,400	1,031,335	133,838	2,548,229	65.90	1,321,056	979,138	1,105,699	954,698
Belt Ry. Co. of Chicago	June	32	.....	.....	548,842	69,821	51,228	2,940	224,847	9,442	358,278	65.30	190,564	145,452	125,775	133,588
	6 mos.	32	.....	.....	3,319,258	304,208	357,721	18,956	1,555,547	62,947	2,299,379	69.30	1,019,879	764,581	763,743	817,592
Bessemer & Lake Erie	June	228	1,709,150	15,666	1,746,689	142,302	368,344	14,716	402,167	41,586	971,662	55.60	775,027	715,801	712,612	414,625
	6 mos.	228	6,910,003	103,122	7,151,618	590,635	2,214,233	92,078	1,964,341	193,905	5,025,156	70.30	2,126,462	1,839,763	2,029,198	797,096
Bingham & Garfield	June	33	54,059	.....	54,922	9,033	10,474	1,488	12,520	4,479	38,202	69.60	16,720	6,020	17,367	11,752
	6 mos.	33	304,749	238	311,807	53,189	54,590	8,809	82,913	28,246	228,943	73.40	82,864	59,277	92,876	82,080
Boston & Maine	June	2,287	4,187,779	1,488,710	6,544,694	837,461	1,369,127	72,902	2,603,261	236,985	5,141,017	78.60	1,403,677	1,145,645	899,703	654,864
	6 mos.	2,287	24,136,841	9,321,446	38,178,823	5,087,861	7,998,203	370,114	16,119,447	1,432,392	31,133,372	81.50	7,045,451	5,490,408	4,150,756	3,297,421
Brooklyn Eastern Dist. Terminal	June	9	115,779	.....	121,866	8,836	15,337	99	42,827	5,714	72,813	59.70	49,053	42,539	42,859	45,624
	6 mos.	9	666,650	.....	707,149	45,410	88,900	1,695	253,057	32,159	421,221	59.60	285,926	243,657	247,767	259,988
Buffalo & Susquehanna R. R. Corp.	June	253	99,250	2,920	105,937	29,752	38,046	1,885	33,949	9,195	112,827	106.50	—6,890	—10,313	—2,012	—7,650
	6 mos.	253	807,007	26,563	854,931	185,632	320,588	11,287	271,644	57,807	846,958	99.10	7,973	—12,450	123,086	96,305
Buffalo, Rochester & Pittsburgh	June	590	1,067,420	111,401	1,246,616	198,144	353,159	27,913	490,337	42,539	1,119,134	89.80	127,482	92,416	89,723	288,038
	6 mos.	590	6,233,485	713,562	7,340,808	828,800	2,174,695	159,824	2,975,005	246,652	6,398,658	87.20	942,150	731,920	828,492	998,676
Canadian Pacific Lines in Maine	June	233	75,617	27,157	115,294	165,894	41,604	5,354	69,892	4,027	286,771	248.70	—171,477	—182,477	—207,430	—117,595
	6 mos.	233	1,074,276	177,394	1,341,881	427,918	301,403	28,549	594,277	24,151	1,376,298	102.60	—34,417	—100,417	—184,731	40,323
Central of Georgia	June	1,920	1,600,554	435,228	2,192,024	395,980	463,198	73,591	872,246	93,817	1,877,289	85.60	314,735	215,787	190,960	175,497
	6 mos.	1,920	9,958,053	2,765,071	14,074,206	2,317,643	2,600,329	417,997	5,269,421	558,548	11,147,710	79.20	2,926,496	2,294,491	2,049,543	2,077,237
Central of New Jersey	June	692	3,823,716	835,139	4,969,600	524,286	1,073,863	36,821	1,801,812	108,194	3,565,949	71.80	1,403,651	1,004,031	820,319	545,801
	6 mos.	692	21,570,639	4,326,342	27,747,919	3,001,759	6,155,256	226,424	10,611,799	653,919	20,769,374	74.90	6,978,545	4,761,803	3,995,680	2,041,078
Central Vermont	June	434	544,358	97,500	715,861	178,828	117,661	16,374	314,952	22,041	651,363	90.99	64,498	45,408	28,929	2,938
	6 mos.	434	3,053,653	612,784	4,057,608	1,051,311	743,789	86,509	1,915,101	143,315	3,949,409	97.33	108,199	—6,911	—103,790	73,586
Chesapeake & Ohio	June	2,600	9,028,129	849,605	10,328,949	1,482,187	2,562,128	113,818	2,846,811	240,721	7,282,635	70.50	3,046,314	2,556,539	2,750,970	2,070,638
	6 mos.	2,599	49,040,040	4,675,993	56,317,178	8,141,857	15,067,389	641,591	16,637,800	1,358,836	42,052,057	74.70	14,265,121	11,526,566	12,638,211	10,985,595
Chicago & Alton	June	1,055	1,633,325	567,627	2,424,855	436,781	489,226	62,170	835,092	60,718	1,879,270	77.50	545,585	445,607	307,814	355,063
	6 mos.	1,055	9,974,757	3,005,969	14,339,971	1,807,268	3,312,287	380,990	5,442,372	342,268	11,295,166	78.80	3,044,811	2,447,291	1,593,471	1,866,320
Chicago & Eastern Illinois	June	945	1,437,128	397,373	1,992,366	219,598	612,971	57,219	739,265	71,423	1,714,661	86.10	277,705	166,902	40,767	—90,353
	6 mos.	945	9,161,679	2,151,931	12,314,290	1,212,058	3,847,876	347,237	4,900,058	415,567	10,817,429	87.80	1,496,861	867,468	307,409	233,615
Chicago & North Western	June	8,462	8,474,885	2,561,246	12,522,953	1,885,993	2,280,584	186,560	4,551,540	336,515	9,341,235	74.60	3,181,718	2,378,149	2,291,662	1,522,986
	6 mos.	8,462	47,122,832	12,777,085	67,688,430	8,624,732	14,906,460	1,002,656	28,123,644	2,084,001	55,115,958	81.40	12,572,472	7,750,700	6,951,641	5,665,306
Chicago, Burlington & Quincy	June	9,399	9,101,570	2,318,879	12,730,440	1,976,263	2,242,573	273,498	4,305,614	369, 353	9,261,784	72.80	3,468,656	2,640,653	2,352,037	1,977,087
	6 mos.	9,396	53,455,161	11,461,883	72,373,466	8,726,749	17,014,315	1,489,933	26,884,667	2,182,117	56,687,732	78.30	15,685,734	10,889,328	9,519,473	10,884,618
Chicago Great Western	June	1,496	1,382,523	291,678	1,840,802	410,568	368,116	74,716	750,813	53,203	1,669,795	90.70	171,007	92,957	—24,747	84,796
	6 mos.	1,496	8,520,877	1,673,471	11,160,924	1,652,416	2,519,573	417,173	4,760,794	330,947	9,753,007	87.40	1,407,917	923,531	229,930	583,469
Chicago, Indianapolis & Louisville	June	649	1,033,468	229,305	1,403,934	159,323	307,817	36,071	493,039	33,129	1,040,394	74.10	363,540	292,642	177,909	133,500
	6 mos.	649	6,158,468	1,403,747	8,391,504	831,299	1,771,503	208,484	3,042,311	202,993	6,146,031	73.20	2,245,473	1,825,923	1,118,925	890,809

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR, 1925—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or less).	Net after rents.	Net after rents, 1924.
Chicago, Milwaukee & St. Paul	June	11,205	$9,902,599	$1,872,221	$13,196,239	$2,709,703	$3,662,276	$238,270	$4,743,528	$346,122	$11,777,214	89.20	$1,419,025	$614,414	$191,063	$1,174,556
	6 mos.	11,204	56,514,648	9,393,612	73,529,970	10,886,579	19,369,315	1,193,505	2,964,984	2,067,659	63,486,498	86.30	10,043,472	5,457,717	3,142,656	4,315,219
Chicago, Peoria & St. Louis	June	215	53,158	6,779	65,331	15,050	11,894	828	35,710	7,785	71,267	109.10	—5,936	—8,730	—16,927	—25,588
	6 mos.	231	427,274	53,116	524,693	91,333	97,727	8,515	269,764	48,959	516,298	98.40	8,395	—10,163	—117,018	—144,773
Chicago River & Indiana	June	19	.....	.....	551,082	89,036	87,898	663	209,309	12,559	399,465	72.50	151,617	111,500	214,497	206,873
	6 mos.	19	.....	.....	3,372,675	463,875	513,248	4,756	1,346,031	75,534	2,403,444	71.30	969,231	732,144	1,380,732	1,553,501
Chicago, Rock Island & Pacific	June	7,578	7,727,064	2,082,436	10,541,425	1,412,982	2,384,785	223,881	3,970,223	290,117	8,367,957	79.40	2,173,468	1,627,018	1,159,200	489,099
	6 mos.	7,578	42,580,946	11,338,937	58,380,991	6,899,372	14,006,875	1,315,522	23,594,873	1,772,682	47,839,279	81.90	10,541,712	7,360,217	4,950,522	4,017,291
Chicago, Rock Island & Gulf	June	461	356,896	86,724	490,370	79,463	66,695	19,985	214,772	16,036	401,203	81.80	89,167	56,303	35,075	18,055
	6 mos.	461	2,228,432	447,795	2,939,785	419,448	415,093	99,700	1,282,000	98,901	2,339,297	79.60	600,488	502,982	364,263	410,595
Chic., St. Paul, Minn. & Omaha	June	1,749	1,456,077	504,402	2,139,352	336,554	431,844	31,321	885,700	75,895	1,771,897	82.80	367,455	243,655	194,485	102,741
	6 mos.	1,749	8,917,636	2,582,841	12,443,031	1,487,802	2,516,871	173,987	5,611,771	456,798	10,297,050	82.80	2,145,981	1,460,595	1,055,344	1,117,676
Cin., Indianapolis & Western	June	347	333,227	30,544	391,326	62,718	74,171	16,664	153,605	17,810	325,994	83.30	65,332	47,736	18,756	10,123
	6 mos.	347	1,950,198	174,912	2,297,346	283,887	465,804	94,907	970,333	106,446	1,926,984	83.90	370,362	261,609	92,857	73,502
Clinchfield R. R.	June	309	639,866	27,114	684,271	89,638	164,290	23,206	136,353	21,346	432,212	63.20	252,059	197,055	221,432	175,257
	6 mos.	309	4,108,212	183,793	4,379,332	486,273	1,122,025	147,591	901,837	121,083	2,769,818	63.30	1,609,504	1,279,476	1,621,590	1,203,104
Colorado & Southern	June	1,056	755,525	135,299	971,933	187,791	222,065	15,994	346,188	39,823	820,897	84.50	151,036	87,315	74,500	55,415
	6 mos.	1,056	4,413,862	692,467	5,601,231	822,139	1,378,618	82,079	2,180,762	244,418	4,746,439	84.70	854,792	471,230	421,191	497,911
Ft. Worth & Denver City	June	491	561,316	174,324	795,033	92,987	181,330	18,378	232,716	34,737	567,504	71.40	227,529	168,244	158,892	146,103
	6 mos.	491	3,856,306	931,055	5,140,854	497,992	1,096,642	90,810	1,606,536	212,155	3,538,711	68.80	1,602,143	1,245,783	1,266,490	1,205,499
Wichita Valley	June	271	79,378	20,602	107,107	15,622	10,015	.....	36,359	1,761	61,993	57.90	45,114	34,496	17,836	14,343
	6 mos.	271	581,755	124,532	756,756	139,268	51,216	241	256,894	10,595	451,943	59.70	304,813	241,630	128,737	222,474
Columbus & Greenville	June	167	92,510	19,454	118,857	47,082	15,727	2,706	43,733	10,005	118,929	100.10	—72	—1,578	—13,553	—14,778
	6 mos.	167	563,853	137,186	744,212	279,809	98,112	16,231	273,876	59,910	726,319	97.60	17,893	6,957	—58,273	29,103
Delaware & Hudson	June	881	3,445,151	265,849	3,981,385	394,353	971,710	46,732	1,277,584	142,223	2,858,897	71.80	1,122,488	1,009,926	1,032,097	795,172
	6 mos.	886	19,360,122	1,550,045	22,455,713	2,607,379	5,876,520	292,191	8,138,766	854,447	17,944,192	79.90	4,511,521	3,835,997	3,974,394	2,761,003
Delaware, Lackawanna & Western	June	992	5,732,434	1,130,716	7,730,162	824,036	1,470,895	128,712	2,773,692	165,239	5,406,401	69.90	2,323,761	1,673,214	1,739,982	1,341,507
	6 mos.	992	32,226,651	6,361,488	4,356,491	4,122,888	9,406,828	735,969	16,809,564	984,961	32,353,875	74.30	11,207,616	7,683,067	7,864,526	7,281,604
Denver & Rio Grande Western	June	2,577	1,871,170	510,968	2,626,607	652,471	395,715	53,667	756,333	90,088	2,019,904	76.90	606,703	433,659	502,311	165,838
	6 mos.	2,570	11,090,525	2,154,011	14,429,735	2,644,401	2,876,736	306,958	4,790,075	524,957	11,386,855	78.90	3,042,880	2,027,474	2,295,554	1,591,173
Denver & Salt Lake	June	255	173,113	22,886	220,403	99,203	76,299	1,972	51,882	5,943	235,299	106.80	—14,896	—23,925	—15,438	—20,019
	6 mos.	255	1,093,319	136,041	1,355,646	324,816	507,548	8,011	389,508	37,172	1,267,055	93.50	88,591	34,440	58,663	—89,279
Detroit & Mackinac	June	375	121,231	18,299	157,459	52,266	38,629	1,947	52,956	5,597	151,160	96.00	6,299	—3,831	5,653	19,605
	6 mos.	375	611,822	123,442	813,840	171,103	218,858	12,564	323,578	34,703	760,146	93.40	53,694	—6,813	69,473	108,631
Detroit & Toledo Shore Line	June	61	274,618	.....	276,627	53,607	29,964	2,953	78,144	8,049	172,717	62.40	103,910	83,392	18,742	—15,791
	6 mos.	61	1,816,597	.....	1,847,108	236,391	209,768	17,233	514,311	48,913	1,026,616	55.50	820,492	688,457	242,824	58,431
Detroit Terminal	June	26	.....	.....	220,762	33,976	16,546	.....	101,932	2,750	155,204	70.30	65,558	46,953	64,917	10,896
	6 mos.	26	.....	.....	1,207,569	129,599	92,088	80	583,667	12,474	817,908	67.70	389,661	272,675	357,009	293,123
Detroit Toledo & Ironton	June	470	1,107,441	6,343	1,125,611	204,978	175,737	8,589	289,978	27,583	706,147	62.70	419,464	371,405	264,075	98,965
	6 mos.	470	6,580,941	40,481	6,712,080	1,016,131	1,056,533	50,503	1,771,769	161,992	4,039,955	60.20	2,672,125	2,379,257	1,768,286	1,510,227
Duluth & Iron Range	June	276	840,047	5,162	953,120	167,907	122,892	962	210,712	25,271	528,042	55.40	425,078	362,151	365,564	313,319
	6 mos.	276	2,466,702	40,669	2,778,594	584,140	712,892	7,047	902,097	117,230	2,325,537	83.70	453,057	262,792	277,729	—110,932
Duluth, Missabe & Northern	June	307	2,430,750	6,402	2,767,998	281,323	183,667	3,276	403,437	35,405	907,749	32.80	1,860,249	1,892,227	1,881,206	1,113,988
	6 mos.	305	6,183,690	45,426	6,907,974	1,019,247	1,135,862	19,088	1,439,908	140,914	3,759,120	54.40	3,148,854	2,501,895	2,460,767	631,403
Duluth, Winnipeg & Pacific	June	178	143,167	14,917	164,402	48,535	35,253	4,994	67,055	8,216	166,163	101.10	—1,761	—9,792	—3,582	—32,849
	6 mos.	178	1,068,241	73,622	1,177,331	192,774	222,113	26,140	451,531	45,656	942,749	80.10	234,582	176,106	197,641	162,455
Elgin, Joliet & Eastern	June	459	1,786,257	14	1,926,710	207,530	441,471	12,361	642,388	53,383	1,356,714	70.40	569,996	482,423	314,794	65,218
	6 mos.	459	11,754,044	110	12,909,321	1,063,318	2,910,338	76,461	4,949,161	269,871	8,812,810	68.30	4,096,511	3,569,306	2,305,269	1,665,074
Erie R. R.	June	2,055	7,291,084	1,114,193	9,175,474	1,136,089	1,991,792	149,176	3,249,776	308,919	6,868,101	74.90	2,307,373	1,937,360	1,978,608	869,488
	6 mos.	2,055	40,143,729	6,199,064	50,542,451	5,983,692	13,128,241	897,344	20,399,917	1,764,586	42,398,077	83.90	8,144,374	5,966,289	6,448,756	6,691,013
Chicago & Erie	June	269	969,217	66,257	1,137,752	128,712	130,272	23,483	347,648	41,387	672,034	59.10	465,718	408,801	125,652	24,808
	6 mos.	269	5,978,436	336,776	6,859,949	706,046	842,017	141,245	2,253,917	235,346	4,179,017	60.90	2,680,932	2,349,960	691,023	475,880
New Jersey & New York	June	45	23,964	107,058	136,473	17,303	20,454	1,705	66,487	4,094	110,043	80.60	26,430	22,637	—9,697	—961
	6 mos.	45	148,134	614,918	792,019	105,208	137,406	8,605	436,916	25,405	713,538	90.10	78,481	56,498	—129,699	—64,890
N. Y., Susquehanna & Western	June	135	366,594	57,066	468,604	51,726	58,190	4,367	202,027	11,992	318,268	67.90	150,336	121,260	106,853	—19,749
	6 mos.	135	1,918,481	340,040	2,520,960	282,010	351,095	24,942	1,235,255	68,496	1,961,606	77.80	559,354	386,056	295,021	—151,575
E'sville, Indianapolis & Terre Haute	June	146	182,297	3,962	192,006	35,308	41,527	1,956	60,707	3,532	143,030	74.50	48,976	43,894	8,834	—8,829
	6 mos.	146	1,092,758	23,282	1,155,475	162,476	207,076	10,854	384,017	24,284	788,499	68.20	366,976	326,222	195,159	61,838
Florida East Coast	June	770	1,217,159	491,810	1,927,089	382,006	310,274	15,317	680,699	38,705	1,437,720	74.60	489,369	376,395	205,138	—30,221
	6 mos.	770	7,961,320	4,440,955	14,019,401	1,966,640	1,714,418	124,653	5,060,388	234,960	9,273,533	66.10	4,745,508	4,056,559	3,008,370	2,904,699
Fort Smith & Western	June	249	104,356	14,660	127,985	24,616	27,639	5,029	42,425	7,692	106,756	83.40	21,229	15,700	1,566	—7,821
	6 mos.	249	704,462	96,178	852,969	145,798	154,810	31,362	274,666	45,697	653,132	76.50	199,837	166,594	82,114	—37,335
Galveston Wharf Co	June	13	.....	.....	105,309	57,789	5,090	766	30,573	2,732	102,697	97.50	2,612	—14,514	—14,510	—19,244
	6 mos.	13	.....	.....	858,228	309,309	25,055	5,240	218,986	16,216	619,197	72.10	239,031	134,953	133,798	—22,427
Georgia R. R.	June	328	364,342	87,529	483,492	56,561	84,962	22,215	197,280	19,803	370,581	78.50	103,911	106,980	117,058	17,485
	6 mos.	328	2,224,269	511,903	2,952,370	334,970	595,423	137,562	1,239,288	122,147	2,427,727	82.20	524,643	475,696	452,713	367,236
Georgia & Florida	June	406	112,711	18,225	137,826	17,716	16,382	7,643	52,260	7,375	101,596	73.70	36,230	29,562	14,455	—402
	6 mos.	406	655,097	90,844	788,736	112,426	96,026	45,596	309,039	44,190	608,601	77.20	180,135	140,619	46,221	79,356

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR, 1925—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or less).	Net after rents.	Net after rents, 1924.
Grand Trunk Western	June	347	$1,320,117	$197,817	$1,607,747	$256,900	$362,101	$43,682	$517,089	$55,171	$1,244,693	77.40	$363,054	$300,613	$165,988	—$181,817
	6 mos.	347	7,351,482	942,523	8,790,573	1,006,269	2,244,087	225,713	3,294,480	324,568	7,142,862	81.30	1,647,711	1,237,522	378,899	—167,496
Atlantic & Saint Lawrence	June	166	135,364	26,958	183,522	63,953	35,233	6,820	100,422	8,671	216,625	118.00	—33,103	—50,734	—103,631	—136,373
	6 mos.	166	1,004,153	176,537	1,284,369	286,641	207,697	34,814	692,282	50,598	1,282,322	99.80	2,047	—96,762	—481,279	—693,441
Chic., Det. & Canada Gr. Tr. Jct.	June	59	207,474	4,073	251,779	42,814	11,838	4,406	75,158	3,269	137,473	54.60	114,306	106,281	78,438	29,421
	6 mos.	59	1,278,308	24,752	1,547,192	154,038	73,439	24,668	477,290	20,698	750,084	48.50	797,108	729,816	558,492	538,437
Det., Grand Haven & Milwaukee	June	189	512,087	31,033	591,746	94,709	50,941	12,478	225,342	17,314	401,134	67.80	190,612	186,617	90,968	—37,211
	6 mos.	189	2,741,296	171,218	3,196,748	360,701	299,824	67,169	1,412,193	101,235	2,240,421	70.10	956,327	928,174	377,278	205,488
Great Northern	June	8,252	7,365,416	1,355,520	9,787,107	1,666,326	1,460,624	226,825	2,950,299	229,548	6,616,154	67.60	3,170,953	2,345,329	2,359,931	1,922,900
	6 mos.	8,251	35,734,557	6,279,453	46,840,306	7,161,857	8,137,055	1,105,652	17,470,604	1,353,733	35,683,864	76.20	11,156,442	6,623,042	6,844,566	5,810,101
Green Bay & Western	June	234	111,951	6,123	123,469	26,886	15,104	4,339	52,068	2,757	91,125	73.80	32,344	24,050	18,340	13,090
	6 mos.	234	620,824	53,135	717,731	138,073	96,528	24,440	268,415	16,689	544,082	75.80	173,649	127,855	90,345	101,516
Gulf & Ship Island	June	307	208,635	40,685	277,468	63,518	38,967	6,839	81,094	15,243	219,969	79.30	57,499	33,218	26,582	29,151
	6 mos.	307	1,375,821	229,470	1,786,483	293,341	261,338	45,626	508,218	93,076	1,274,307	71.30	512,176	351,868	274,899	310,073
Gulf, Mobile & Northern	June	465	410,740	27,456	459,953	68,193	77,960	24,995	139,395	21,870	332,921	72.38	127,032	88,841	82,067	61,029
	6 mos.	465	2,715,835	193,528	3,034,873	462,057	535,470	133,963	901,879	148,773	2,184,634	71.98	850,239	657,342	586,220	579,480
Hocking Valley	June	348	1,539,210	65,717	1,796,855	213,598	438,261	14,045	490,883	41,732	1,195,775	66.50	601,080	500,588	421,782	401,643
	6 mos.	348	7,767,767	380,637	8,857,103	943,817	2,590,305	84,902	2,656,396	240,885	6,512,057	73.50	2,345,046	1,740,721	1,690,254	1,763,108
Illinois Central	June	4,875	9,039,300	1,957,057	11,952,242	2,016,229	2,906,088	209,094	4,110,336	321,557	9,597,583	80.30	2,354,659	1,453,844	1,483,259	1,364,259
	6 mos.	4,875	54,917,383	12,001,418	72,992,335	10,072,269	16,504,296	1,284,800	26,617,588	1,938,754	56,618,618	77.60	16,373,717	10,953,634	11,278,406	12,325,782
Yazoo & Mississippi Valley	June	1,380	1,493,941	239,675	1,827,832	307,197	332,460	29,648	643,186	48,957	1,363,277	74.20	474,555	345,615	300,828	106,680
	6 mos.	1,380	8,861,200	1,552,913	11,035,090	1,692,284	1,898,661	175,042	4,044,340	286,286	8,071,398	73.10	2,963,692	2,191,407	1,977,006	1,643,098
Illinois Central Combined Report	June	6,255	10,533,241	2,196,732	13,790,074	2,323,426	3,238,548	238,742	4,753,522	370,514	10,960,860	79.50	2,829,214	1,799,459	1,784,087	1,470,949
	6 mos.	6,255	63,778,583	13,554,331	84,027,425	11,764,553	18,402,957	1,459,842	30,661,928	2,225,040	64,690,016	77.00	19,337,409	13,145,041	13,255,412	13,968,880
Kansas City, Mexico & Orient	June	272	176,744	9,451	194,085	36,375	56,135	5,083	68,748	6,575	172,916	89.10	21,169	16,842	1,347	—26,518
	6 mos.	272	1,277,759	43,716	1,365,915	229,433	317,470	33,658	481,045	148,492	1,210,096	88.60	155,819	102,885	—27,605	—109,748
Kan. City, Mex. & Orient of Tex.	June	465	243,163	12,728	264,176	52,054	62,685	5,695	89,077	6,565	215,983	81.80	48,193	40,507	18,317	732
	6 mos.	465	1,516,916	78,067	1,649,029	292,329	332,494	37,913	545,267	36,973	1,244,749	75.50	404,280	361,734	237,878	—24,025
Kansas City Southern	June	773	1,160,813	144,197	1,449,254	210,821	260,703	43,969	474,573	75,184	1,069,678	73.80	379,576	285,458	259,510	211,524
	6 mos.	773	7,088,701	762,266	8,675,784	1,155,387	1,648,352	264,326	2,861,121	450,817	6,369,814	73.40	2,305,970	1,736,544	1,572,229	1,372,703
Texarkana & Ft. Smith	June	81	248,862	11,630	275,435	44,839	34,424	6,014	70,166	9,319	166,296	60.30	109,129	93,277	68,436	48,197
	6 mos.	81	1,295,500	65,890	1,475,564	179,814	123,741	33,268	419,642	55,725	822,831	55.80	652,733	557,442	410,800	448,453
Kansas, Oklahoma & Gulf	June	314	174,783	6,393	186,022	47,614	33,414	8,216	65,670	9,006	164,009	88.20	22,013	15,113	5,776	—29,062
	6 mos.	314	934,131	43,260	1,007,870	322,465	189,504	50,068	416,394	51,274	1,029,398	102.10	—21,528	—69,593	—122,917	—57,751
Lake Superior & Ishpeming	June	161	193,594	1,938	223,917	42,952	24,587	472	47,804	7,222	123,016	54.90	100,901	89,390	87,031	60,331
	6 mos.	161	677,989	24,392	781,652	193,108	154,081	2,874	249,121	31,096	630,215	80.60	151,437	80,327	57,947	—2,085
Lake Terminal R. R.	June	13	.....	.....	106,382	17,044	17,206	.....	55,792	1,892	91,934	86.40	14,448	8,549	12,183	—5,065
	6 mos.	13	.....	.....	568,379	88,233	108,227	.....	329,506	10,422	536,388	94.40	31,991	—4,408	7,570	—75,178
Lehigh & Hudson River	June	96	233,601	3,036	248,371	41,748	43,238	2,172	89,495	9,388	186,041	74.90	62,330	50,621	27,819	34,045
	6 mos.	96	1,465,761	16,376	1,557,991	179,024	274,935	12,465	588,282	58,486	1,113,192	71.50	444,799	364,302	215,608	233,615
Lehigh & New England	June	219	524,397	1,301	534,905	68,239	98,349	5,082	152,285	20,237	342,613	64.10	192,292	167,015	162,779	127,961
	6 mos.	219	2,636,323	9,816	2,682,429	307,929	649,760	33,327	834,463	114,428	1,937,525	72.00	754,904	644,203	667,543	457,878
Lehigh Valley	June	1,374	5,651,198	685,120	6,856,301	719,606	1,301,226	135,311	2,403,073	160,813	4,750,971	69.30	2,105,330	1,674,486	1,666,420	1,026,688
	6 mos.	1,374	31,744,605	3,638,863	37,373,699	4,113,391	7,800,832	722,833	15,085,114	876,402	28,758,682	74.90	9,615,017	7,520,293	6,924,431	5,127,045
Louisiana & Arkansas	June	302	275,532	19,070	304,706	29,008	69,589	11,187	83,825	15,437	208,794	68.50	95,912	69,402	57,909	21,073
	6 mos.	302	1,770,423	136,992	1,957,581	298,161	391,510	62,547	2,554,574	78,210	1,381,073	70.50	576,508	414,442	342,070	374,369
Louisiana Ry. & Nav. Co.	June	337	297,210	19,183	334,491	74,162	36,378	10,082	122,401	9,774	251,685	75.20	82,806	62,440	33,638	7,884
	6 mos.	337	1,590,725	105,557	1,816,010	403,241	256,369	62,282	766,872	61,368	1,541,804	84.90	274,206	153,166	—22,858	—95,364
Louisiana Ry. & Nav. Co. of Tex.	June	206	64,121	7,679	77,593	13,234	15,220	3,052	47,546	5,520	84,572	110.00	—6,977	—10,877	—27,708	—14,995
	6 mos.	206	518,987	46,123	602,399	113,897	100,671	18,920	299,220	33,191	565,829	93.90	36,572	12,750	—87,287	—94,617
Louisville & Nashville	June	5,044	8,831,502	1,929,058	11,470,306	1,815,249	2,559,478	243,072	3,833,962	342,112	8,833,461	77.00	2,636,845	2,140,127	2,172,222	1,528,826
	6 mos.	5,044	52,335,216	10,860,743	67,375,849	9,935,827	15,849,709	15,672,288	24,119,228	1,659,436	53,283,346	79.10	14,092,503	11,141,879	11,136,020	8,463,349
Louisville, Henderson & St. Louis	June	199	211,976	52,140	281,834	69,987	40,117	7,536	86,961	9,344	213,945	75.90	67,889	53,424	44,135	11,145
	6 mos.	199	1,392,483	319,684	1,823,577	325,129	242,697	43,342	587,619	57,647	1,256,434	68.90	657,143	461,215	384,921	221,319
Maine Central	June	1,207	1,111,283	346,715	1,638,557	287,256	280,258	12,990	598,914	50,180	1,232,006	75.20	406,951	306,429	310,946	210,684
	6 mos.	1,207	7,254,749	1,870,513	10,039,544	1,578,843	1,935,585	76,904	3,964,566	299,276	7,856,383	78.30	2,183,161	1,580,530	1,530,290	1,148,879
Midland Valley	June	364	300,654	39,397	351,732	67,293	49,037	6,329	102,255	17,544	241,370	68.60	110,362	93,527	75,415	24,691
	6 mos.	364	1,813,989	247,534	2,147,226	351,650	286,791	36,801	639,728	112,315	1,419,042	66.10	728,184	626,742	514,214	545,554
Minneapolis & St. Louis	June	1,638	937,072	107,907	1,106,778	215,817	284,906	31,803	473,796	44,337	1,049,783	94.90	56,995	—4,307	—64,747	—212,951
	6 mos.	1,638	5,908,353	628,087	6,931,383	1,370,648	1,633,852	184,987	3,271,450	288,768	6,742,758	97.30	188,625	—199,971	—507,879	—910,425
Minneapolis, St. P. & S. S. Marie	June	4,400	3,003,426	604,262	3,974,656	677,794	700,492	73,198	1,429,411	116,828	3,027,994	76.20	946,862	709,667	654,975	317,107
	6 mos.	4,402	16,898,943	2,861,463	21,479,315	3,131,374	4,224,323	413,389	8,808,686	667,944	17,338,237	80.70	4,141,078	2,696,694	2,116,791	1,246,952
Duluth, South Shore & Atlantic	June	590	380,995	71,176	508,479	121,670	89,167	6,742	198,379	11,221	432,460	85.00	76,019	48,019	24,441	43,401
	6 mos.	591	2,126,387	478,727	2,838,087	465,608	513,504	41,975	1,188,305	68,658	2,308,974	81.40	529,113	355,104	238,607	199,258
Spokane International	June	165	82,496	11,372	100,356	17,561	8,039	3,065	31,038	6,260	67,012	66.80	33,344	28,140	20,412	6,849
	6 mos.	165	452,175	71,491	557,990	79,337	48,050	19,032	197,798	39,074	389,320	69.80	168,670	137,389	97,361	89,174
Mississippi Central	June	164	106,626	10,388	121,444	14,991	23,919	7,144	33,023	9,581	88,508	72.90	32,936	21,614	30,077	27,116
	6 mos.	178	669,152	67,690	766,231	100,414	131,407	42,024	215,740	51,953	541,388	70.60	224,843	161,747	184,672	229,592

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR, 1925—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or less).	Net after rents.	Net after rents, 1924.
Missouri & North Arkansas	June	364	$85,209	$15,748	$109,736	$27,336	$21,525	$5,362	$43,293	$6,754	$103,381	94.20	$6,355	$3,693	—$4,404	—$20,493
	6 mos.	364	593,162	90,573	734,220	163,548	130,437	31,153	294,281	42,581	661,111	90.00	73,109	61,430	7,583	—20,679
Missouri-Kansas-Texas	June	1,799	2,178,002	414,996	2,803,157	272,458	597,064	55,572	705,943	94,111	1,734,672	61.90	1,068,485	949,801	933,687	546,689
	6 mos.	1,799	12,812,944	2,375,667	16,451,790	1,606,706	3,547,835	318,964	4,474,650	555,812	10,556,380	64.20	5,895,410	4,834,757	4,841,247	4,061,879
Mo., Kansas, Texas of Texas	June	1,389	1,005,342	375,996	1,521,096	314,317	283,529	47,114	635,572	66,119	1,343,859	88.30	177,237	97,798	—79,947	124,317
	6 mos.	1,389	7,429,633	2,152,301	10,473,018	1,588,837	1,665,941	256,370	4,208,040	406,986	8,151,571	77.80	2,321,447	1,952,642	783,601	661,988
Missouri Pacific	June	7,337	8,205,234	1,385,574	10,381,546	1,733,946	2,038,110	285,197	3,888,545	335,868	8,315,017	80.10	2,066,529	1,754,374	1,348,555	981,105
	6 mos.	7,337	49,617,751	7,942,695	62,392,574	9,127,003	12,899,727	1,506,527	24,156,223	1,960,707	49,993,566	80.10	12,399,008	9,992,480	7,251,688	6,291,241
Gulf Coast Lines	June	922	962,254	159,888	1,172,164	180,809	179,698	33,546	320,378	51,974	765,636	65.32	406,528	345,663	348,091	397,737
	6 mos.	922	6,069,009	981,954	7,531,076	1,162,820	1,014,176	196,147	2,118,465	278,250	4,734,732	62.87	2,796,344	2,427,496	2,170,652	2,341,226
International-Great Northern	June	1,159	934,194	193,184	1,233,996	275,745	239,769	31,482	507,935	65,961	1,082,811	87.75	151,185	119,222	96,749	89,640
	6 mos.	1,159	6,311,801	1,069,869	8,173,272	1,624,480	1,447,367	217,320	3,250,461	339,053	6,750,001	82.59	1,423,271	1,207,045	757,123	615,607
Texas & Pacific	June	1,952	1,837,961	556,760	2,609,674	415,361	561,384	61,862	943,024	90,885	2,072,909	79.40	536,765	383,751	344,062	252,616
	6 mos.	1,952	11,588,605	3,127,449	15,960,846	2,434,172	3,303,098	373,961	6,025,943	556,304	12,690,394	79.60	3,270,452	2,391,397	1,975,925	1,761,535
Mobile & Ohio	June	1,161	1,234,549	118,369	1,432,910	212,266	292,539	52,534	497,888	47,500	1,102,933	77.00	329,977	243,003	215,508	238,172
	6 mos.	1,161	7,898,466	777,467	9,210,421	1,330,951	1,685,381	298,843	3,284,125	270,961	6,871,488	74.60	2,338,933	1,803,145	1,503,990	1,887,156
Monongahela	June	129	434,474	21,196	460,584	62,500	65,000	1,053	115,177	10,216	253,583	55.10	207,001	191,001	131,577	17,322
	6 mos.	131	2,423,511	147,664	2,596,726	375,000	390,000	7,289	704,221	59,337	1,534,245	59.10	1,062,481	966,130	619,448	291,896
Monogahela Connecting	June	7	.....	.....	145,975	16,356	34,424	396	66,709	3,206	121,091	83.00	24,884	20,341	16,296	4,120
	6 mos.	7	.....	.....	1,143,865	128,449	250,462	2,269	574,543	20,344	976,067	85.30	167,798	139,414	135,942	8,364
Montour	June	57	55,389	292	56,716	19,228	29,563	890	13,819	6,716	70,216	123.80	—13,500	—16,710	15,976	57,727
	6 mos.	57	543,315	4,159	553,678	117,057	248,830	5,317	149,732	43,293	564,729	102.00	—11,051	—39,210	150,877	197,583
Nashville, Chattanooga & St. Louis	June	1,259	1,289,159	372,931	1,803,996	347,231	428,368	76,950	661,299	70,405	1,589,953	88.10	214,043	153,871	130,553	123,890
	6 mos.	1,259	8,384,637	2,301,412	11,593,954	1,880,707	2,637,829	468,121	4,240,746	417,125	9,689,926	83.60	1,904,028	1,542,796	1,406,469	1,277,638
Nevada Northern	June	165	69,413	9,815	85,749	18,739	6,761	1,051	14,507	5,621	46,831	54.60	38,918	28,437	29,534	34,200
	6 mos.	165	419,309	55,240	511,889	103,474	45,420	5,780	102,005	32,731	289,911	56.50	221,978	159,103	161,373	212,323
Newburgh & South Shore	June	7	.....	.....	163,735	31,489	33,889	.....	58,126	4,089	127,593	77.90	36,142	23,491	29,051	—24,670
	6 mos.	7	.....	.....	1,029,072	116,394	230,296	.....	405,117	27,420	779,227	75.70	249,845	171,874	200,438	31,095
New Orleans Great Northern	June	274	187,129	27,368	223,805	44,618	39,592	5,951	66,828	9,644	166,642	74.50	57,163	35,768	25,809	30,202
	6 mos.	274	1,206,306	150,747	1,409,867	221,921	240,859	38,343	445,860	63,244	1,010,329	71.70	399,538	278,656	218,733	263,563
New York Central	June	6,922	19,723,883	9,319,326	33,150,108	4,716,544	6,437,520	382,272	10,402,212	911,357	23,274,355	70.20	9,875,753	7,460,689	7,112,890	5,969,845
	6 mos.	6,922	113,847,957	45,623,726	182,867,552	22,947,136	38,801,800	2,190,242	66,255,874	5,405,183	137,947,425	75.40	44,920,127	32,034,988	30,521,013	30,818,777
Cincinnati Northern	June	244	380,834	8,478	400,025	50,248	60,943	6,198	117,575	9,252	244,216	61.10	155,809	129,529	89,696	56,154
	6 mos.	244	2,075,019	49,359	2,170,905	259,925	383,152	36,410	712,400	57,952	1,448,942	66.70	721,963	581,476	417,756	330,108
Cleve., Cin., Chic. & St. Louis	June	2,398	5,425,713	1,499,270	7,555,253	1,026,268	1,518,802	127,212	2,567,826	209,709	5,523,447	73.10	2,031,806	1,572,722	1,411,059	803,046
	6 mos.	2,398	32,202,659	7,689,236	43,557,739	5,010,947	8,936,395	742,455	15,934,620	1,210,589	32,196,571	73.90	11,361,168	8,706,965	8,011,815	6,051,329
Indiana Harbor Belt	June	116	.....	.....	864,597	108,779	113,129	3,967	330,445	22,178	577,962	66.90	286,635	244,271	167,116	42,569
	6 mos.	116	.....	.....	5,321,884	568,343	721,315	29,605	2,278,880	136,650	3,733,358	70.20	1,588,526	1,364,963	782,933	428,654
Michigan Central	June	1,862	5,371,885	1,994,646	8,069,508	876,048	1,440,686	107,290	2,352,798	163,831	5,020,726	62.20	3,048,782	2,495,932	2,445,486	1,393,019
	6 mos.	1,862	29,948,318	9,524,797	43,728,336	4,914,228	8,896,830	631,475	14,624,440	949,183	30,473,070	69.70	13,255,266	10,540,875	10,679,117	9,249,225
Pittsburgh & Lake Erie	June	231	2,069,039	240,112	2,404,290	382,679	761,968	20,953	776,227	72,938	2,014,595	83.80	389,695	238,469	571,310	549,517
	6 mos.	231	14,062,545	1,439,589	16,081,610	2,092,036	4,969,413	139,890	5,251,124	437,643	12,889,314	80.20	3,192,296	2,158,892	4,309,897	4,456,152
New York, Chicago & St. Louis	June	1,695	3,850,095	187,475	4,208,587	694,621	598,974	125,624	1,445,187	153,453	3,023,697	71.80	1,184,890	935,543	733,743	517,916
	6 mos.	1,695	24,677,340	892,462	26,497,148	3,387,779	4,917,012	724,800	9,425,118	960,068	19,349,326	73.00	7,147,822	5,658,438	4,969,301	3,971,931
N. Y., New Haven & Hartford	June	1,935	5,734,480	4,154,865	11,111,739	1,704,191	2,270,164	81,143	3,729,612	307,257	8,262,656	74.40	2,849,083	2,430,894	1,914,462	1,399,568
	6 mos.	1,952	32,449,489	23,652,295	63,143,994	7,773,413	13,397,022	426,374	23,109,869	1,741,557	47,390,681	75.10	15,753,313	13,329,670	10,374,317	8,817,071
Central New England	June	285	638,874	7,012	668,786	137,626	117,391	6,550	196,582	15,735	473,884	70.90	194,902	169,226	123,099	125,881
	6 mos.	291	3,663,188	57,040	3,846,604	627,967	672,211	34,521	1,229,796	88,445	2,652,923	69.00	1,193,681	1,041,446	796,651	817,011
New York Connecting	June	20	179,970	.....	211,294	23,479	13,324	.....	47,437	1,386	85,626	40.50	125,668	84,418	77,746	97,785
	6 mos.	20	1,176,156	.....	1,343,815	78,543	66,708	.....	297,986	7,788	451,025	33.60	892,790	648,790	592,097	554,276
New York, Ontario & Western	June	569	772,333	251,470	1,239,635	166,699	223,955	17,068	472,311	38,177	922,880	74.40	316,755	277,618	235,379	110,377
	6 mos.	569	4,127,744	784,044	5,942,575	810,805	1,274,225	99,970	2,726,106	217,666	5,151,924	86.70	790,651	528,208	297,013	225,094
Norfolk & Western	June	2,241	7,542,450	676,440	8,552,711	1,066,959	1,875,775	97,933	2,219,412	177,755	5,423,655	63.40	3,129,056	2,528,750	2,721,773	953,862
	6 mos.	2,240	41,648,722	3,884,479	47,436,916	6,428,502	10,781,354	585,728	13,723,781	1,050,698	32,537,893	68.60	14,899,023	11,297,228	12,348,426	7,187,119
Norfolk Southern	June	931	592,274	85,715	721,208	107,975	120,695	23,045	276,883	29,087	557,685	77.30	163,523	119,139	82,185	119,328
	6 mos.	931	3,723,945	481,726	4,467,972	605,994	648,128	139,756	1,788,390	171,034	3,354,814	75.10	1,113,158	837,192	609,178	742,708
Northern Pacific	June	6,694	5,535,463	1,515,446	7,836,717	1,465,346	1,526,675	201,588	2,594,386	247,467	6,135,777	78.30	1,700,940	989,326	1,282,702	687,633
	6 mos.	6,694	32,062,656	6,180,816	42,135,293	6,691,001	8,894,843	1,064,057	16,067,587	1,504,292	34,725,420	82.40	7,412,873	3,356,549	5,342,158	5,188,515
Northwestern Pacific	June	496	355,999	207,968	620,262	86,348	80,976	8,760	227,322	17,059	420,454	67.80	199,808	153,699	143,931	148,370
	6 mos.	488	1,759,448	986,133	3,048,195	556,548	499,612	39,565	1,318,121	105,223	2,517,590	82.60	530,605	253,308	197,955	275,859

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR, 1925—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or less).	Net after rents.	Net after rents, 1924.
Pennsylvania R. R.	June	10,507	$37,870,303	$12,023,024	$54,767,223	$6,852,001	$12,882,429	$697,869	$19,279,713	$1,483,160	$41,869,317	76.40	$12,897,906	$9,563,183	$8,077,717	$6,054,171
	6 mos.	10,507	218,702,033	69,997,735	317,798,930	39,532,100	80,868,767	3,975,472	120,915,608	9,079,714	258,595,851	81.40	59,205,079	44,469,628	37,060,951	37,986,734
Balto., Chesa. & Atlantic	June	130	81,561	37,505	127,322	17,957	32,349	3,144	81,264	3,919	138,633	108.90	—11,311	—16,130	—15,116	1,269
	6 mos.	130	418,096	162,252	619,772	79,436	227,038	11,503	454,162	21,251	793,390	128.00	—173,618	—184,881	—191,115	—107,966
Long Island	June	397	916,108	2,436,946	3,602,897	441,695	480,983	29,165	1,311,605	66,436	2,339,343	64.90	1,263,554	1,023,000	794,268	446,821
	6 mos.	397	5,062,311	10,731,296	17,063,138	2,370,227	2,984,420	133,174	7,624,765	434,057	13,598,551	79.70	3,464,587	2,809,923	2,150,356	1,455,234
West Jersey & Seashore	June	361	426,748	675,633	1,169,911	156,025	179,875	19,074	453,749	28,050	837,365	71.60	332,546	222,511	190,994	83,630
	6 mos.	361	2,349,094	3,156,119	5,850,573	976,435	951,339	88,797	2,773,879	155,995	4,949,551	84.60	901,022	672,492	520,574	99,087
Peoria & Pekin Union	June	19	21,009	1,940	135,569	33,841	12,865	1,017	55,220	8,172	111,115	82.00	24,454	8,454	30,434	23,659
	6 mos.	19	150,468	19,824	938,225	125,774	106,554	5,048	424,403	48,604	710,383	75.70	227,842	131,842	257,548	283,682
Pere Marquette	June	2,263	2,904,832	376,024	3,523,184	534,279	765,383	51,337	1,166,396	110,109	2,630,844	74.70	892,340	697,386	588,688	316,597
	6 mos.	2,263	16,094,493	1,987,082	19,439,612	2,338,812	4,456,321	312,327	7,198,596	606,104	14,934,341	76.80	4,505,271	3,583,218	3,172,217	2,509,107
Pittsburgh & Shawmut	June	102	87,448	2,228	91,795	14,139	31,098	1,419	27,903	6,637	81,196	88.50	10,599	10,424	12,404	14,617
	6 mos.	102	550,564	29,156	592,590	84,168	198,392	8,277	180,200	40,240	511,277	86.30	81,313	69,245	102,199	34,414
Pittsburgh & West Virginia	June	92	366,012	6,266	405,059	60,879	90,270	6,293	76,406	16,832	263,855	65.10	141,204	103,186	163,333	120,930
	6 mos.	92	2,036,239	44,548	2,286,139	237,033	558,598	35,907	447,936	109,498	1,459,689	63.80	826,450	583,902	923,579	674,489
Pittsburgh, Shawmut & Northern	June	210	135,754	2,326	142,263	27,045	37,273	3,208	47,973	5,721	121,220	85.20	21,043	18,370	11,159	—15,119
	6 mos.	210	832,870	22,547	875,134	142,315	212,962	11,716	318,306	38,896	724,195	82.70	150,939	134,724	106,313	—62,854
Quincy, Omaha & Kansas City	June	250	56,876	13,668	77,435	31,657	9,716	667	43,584	2,693	88,210	113.90	—10,775	—15,406	—18,108	—19,034
	6 mos.	250	283,265	99,699	426,788	155,546	82,835	4,700	262,625	16,532	520,190	121.90	—93,402	—121,198	—137,800	—84,468
Reading Co.	June	1,139	6,537,730	771,447	7,672,947	1,623,946	1,790,296	74,378	2,650,361	196,578	5,731,063	74.70	1,941,884	1,579,274	1,715,528	1,337,851
	6 mos.	1,139	38,787,613	4,975,914	45,927,507	5,707,237	10,682,391	421,546	17,007,914	1,079,559	34,857,333	75.90	11,070,174	8,868,900	9,522,257	8,495,565
Atlantic City	June	169	143,356	350,524	513,163	71,047	32,468	10,340	202,030	11,533	327,455	63.80	185,708	163,012	130,583	36,999
	6 mos.	169	773,804	1,108,104	1,976,039	552,136	241,479	39,925	1,124,093	32,410	1,990,548	100.70	—14,509	—150,685	—308,564	—445,337
Perkiomen	June	41	111,121	5,772	120,116	13,355	5,093	112	42,516	791	61,909	51.50	58,207	53,153	48,486	32,630
	6 mos.	41	574,222	34,995	630,968	58,173	31,437	649	273,458	4,710	368 691	58.40	262,277	231,209	201,397	181,233
Port Reading	June	19	132,243	.....	191,729	32,773	13,811	229	61,718	5,637	114,152	59.50	77,577	62,180	—6,681	13,586
	6 mos.	19	879,921	.....	1,167,934	135,356	49,913	1,374	409,261	16,814	612,691	52.50	555,243	458,810	37,188	—8,590
Richmond, Fred'ksburg & Potomac	June	117	578,011	289,809	1,033,806	142,114	176,204	8,267	341,779	37,561	727,607	70.40	306,199	252,405	202,528	260,219
	6 mos.	117	3,195,584	2,277,107	6,583,583	635,350	985,471	53,089	2,091,017	205,884	4,151,122	63.10	2,432,461	2,050,418	1,641,548	1,433,387
Rutland	June	413	318,584	89,610	544,782	113,089	99,674	10,324	211,380	13,963	450,112	82.60	94,670	67,393	72,576	59,399
	6 mos.	413	1,851,931	561,085	3,057,055	568,555	659,368	58,395	1,336,166	83,265	2,714,540	88.80	342,515	203,308	269,855	397,242
St. Louis-San Francisco	June	4,902	5,218,810	1,418,630	7,144,101	919,917	1,423,623	108,913	2,312,636	231,076	4,981,527	69.70	2,162,574	1,762,107	1,716,167	1,412,245
	6 mos.	4,902	30,979,043	7,892,317	41,843,014	4,863,965	8,294,804	623,582	14,599,529	1,386,304	29,659,183	70.90	12,183,831	10,005,562	9,868,732	8,814,981
Ft. Worth & Rio Grande	June	233	60,053	19,831	90,422	18,927	21,491	3,339	48,360	4,397	96,496	106.70	—6,074	—10,150	—17,673	739
	6 mos.	233	490,643	110,474	660,206	131,161	136,687	19,235	332,337	29,492	648,178	98.20	12,028	—12,288	—67,005	—13,697
St. Louis, San Francisco & Tex.	June	137	116,422	12,894	135,585	23,660	25,083	5,036	53,736	6,821	114,335	84.30	21,250	18,867	—4,200	—5,536
	6 mos.	137	901,174	75,871	1,011,723	148,459	168,965	30,035	368,861	43,688	759,989	75.10	251,734	237,193	88,227	6,058
St. Louis Southwestern	June	940	1,157,415	114,874	1,344,285	177,534	307,955	50,583	348,330	63.229	961,861	71.60	382,424	337,693	262.055	243,695
	6 mos.	945	7,517,702	739,834	8,740,528	1,232,839	1,896,151	305,224	2,210,791	367,776	6,105,965	69.90	2,634,563	2,311,896	1,830,279	1,759,209
St. Louis Southwestern of Texas	June	807	483,802	69,064	597,230	127,469	163 082	21,470	248,619	31,435	593,475	99.40	3,755	—23,103	21,027	—1,938
	6 mos.	807	2,935,706	417,444	3,633,574	872,193	1,050,399	135,940	1,503,066	191,180	3.769,088	103.70	—135,514	—297,569	—21,232	—77,779
San Antonio, Uvalde & Gulf	June	318	81,453	13,880	105,164	16,796	16,016	5,094	45,609	7,279	90,794	86.30	14,370	10,834	2,377	17,277
	6 mos.	318	623,175	95,830	786,826	127,169	92,277	29,217	314,997	38,667	602,288	76.50	184,538	162,272	95,186	59,472
Seaboard Air Line	June	3,778	3,363,104	818.385	4,584,698	620,627	787,324	173,736	1,702,954	177,044	3,516,138	76.70	1,068,560	835,700	779,436	507,979
	6 mos.	3,760	21,346,830	5,728,530	30,137,491	3,910.123	4,982,512	1,022,906	11,457,988	1,041,314	22,865.735	75.90	7,271,756	5,902,102	4,878,027	4,628,336
Southern Ry.	June	6,868	8,185,872	2,586,785	11,712,566	1,805.787	2,129,266	241,737	3,942,665	321.818	8,531,164	72.80	3,181,402	2,524,552	2,520,310	2,054,770
	6 mos.	6,868	50,939,590	14,483,981	70,998,829	10,387,845	12,704,492	1,420,519	24,673,006	1,892,718	51,604,038	72.70	19,394,791	15,197,740	14,592,464	12,753,157
Alabama Great Southern	June	318	638,396	181,284	866,474	152,360	150,909	20,910	258,721	24,043	610,547	70.50	255,927	196,868	204,881	156,308
	6 mos.	318	3,772,656	928,366	4,993,438	729,936	960,204	122.796	1,557,270	144,722	3,551,493	71.10	1,441.945	1,144,229	1,243,959	1,045,786
Cin., New Orleans & Tex. Pacific	June	338	1,491,784	339,405	1,926,722	228,061	317,140	40.826	523.295	50,957	1,171,944	60.80	754,778	657,338	629,816	315,280
	6 mos.	338	8,581,912	2,093,122	11,285,439	1,549,502	2,005,128	240,900	3,210,633	301,733	7,410,382	65.70	3,875,057	3,296,278	3,200,135	2,500,324
Georgia Southern & Florida	June	401	347,035	144,104	523,472	61,430	75,828	10.969	162,414	11,765	325,876	62.30	197,596	163,357	143,763	43,589
	6 mos.	401	1,857,772	766,467	2,910,551	385,252	382,284	61.708	1,013,960	63,478	1,940,921	66.70	969,630	813,151	595,367	228,058
New Orleans & Northeastern	June	207	354,754	85,882	469,456	66,840	75,983	15,886	140,261	15,941	316,702	67.50	152.754	103,254	86,301	77,251
	6 mos.	207	2,194,503	468,411	2,854,179	365,394	433,009	70,329	838,079	90,299	1.817,981	63.70	1,036,198	720,264	636,627	560,790
Northern Alabama	June	110	115,680	10,413	129,381	21,807	5,385	2,617	37,977	2,944	70,730	54.70	58,651	49,526	22,228	14,957
	6 mos.	110	681,923	60,860	760,406	131,198	28,318	13,100	231,378	19,314	423,236	55.70	337,170	296,405	128,623	129,031
Southern Pacific	June	8,722	13,064,148	4,193,221	19,151,747	2,545,669	3,032,420	334.163	6,587,106	595,651	13,349,422	69.70	5,802,325	4,146,395	3,672,769	4,030,631
	6 mos.	8,722	66,231,832	20,916,132	96,608,164	14,686,470	17,616,412	1,868,028	35,755,001	3,345,526	74,588,685	77.20	22,019,479	13,933,269	13,134,755	17,007,277

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR, 1925—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues			Operating expenses						Operating ratio.	Net from railway operation.	Operating income (or less).	Net after rents.	Net after rents, 1924.
			Freight.	Passenger.	Total (inc. misc.)	Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation	General.	Total.					
Atlantic Steamship Lines	June	...	$686,947	$67,521	$896,697	$19,132	$192,464	$15,558	$598,545	$35,147	$860,846	96.00	$35,851	$21,308	$21,176	—$58,062
	6 mos.	...	4,491,142	267,650	5,580,745	93,647	1,193,405	114,419	4,186,970	183,153	5,771,594	103.40	—190,849	—278,548	—280,054	18,681
Galveston, Harrisb'g & S. Antonio	June	2,096	1,711,314	431,168	2,293,019	411,872	488,967	49,844	812,822	114,082	1,903,152	83.00	389,867	299,101	231,009	360,713
	6 mos.	1,621	8,918,706	2,368,166	12,121,303	2,225,460	2,578,367	289,678	4,288,987	595,774	10,106,140	83.40	2,015,163	1,578,362	1,220,530	1,482,354
Houston & Texas Central	June	929	750,580	245,900	1,075,213	167,138	196,126	24,846	375,649	49,628	815,550	75.90	259,663	231,107	177,296	56,287
	6 mos.	929	5,334,188	1,495,569	7,324,111	1,530,291	1,412,293	160,938	2,503,338	282,609	5,894,929	80.50	1,429,182	1,062,469	750,748	156,506
Houston, East & West Texas	June	191	234,470	40,340	286,884	41,312	45,858	4,386	97,613	9,627	198,395	69.20	88,489	78,491	59,074	—1,727
	6 mos.	191	1,273,151	217,791	1,566,901	363,454	303,997	22,378	548,237	56,306	1,292,356	82.50	274,545	215,294	112,911	—117,042
Louisiana Western	June	207	242,144	81,044	345,491	38,753	77,393	11,651	104,307	19,077	255,351	73.90	90,140	77,293	71,102	32,376
	6 mos.	207	1,422,064	462,169	2,028,283	371,823	427,681	73,109	633,019	114,296	1,643,618	81.00	384,665	259,816	213,142	286,312
Morgan's L. & T. R. R. & S. S. Co.	June	400	410,889	125,292	581,907	91,188	147,848	19,370	269,331	38,276	571,524	98.20	10,383	—39,876	—63,666	—180,218
	6 mos.	400	2,963,621	731,674	3,993,813	725,631	996,675	117,289	1,760,764	229,982	3,859,256	96.60	134,557	—170,840	—375,405	—461,808
Texas & New Orleans	June	544	747,110	152,843	949,828	135,714	186,338	13,579	272,010	35,592	648,934	68.30	300,894	268,843	234,994	—5,978
	6 mos.	538	4,177,175	897,892	5,378,453	935,981	1,257,282	84,417	1,862,649	198,099	4,361,055	81.10	1,017,398	823,911	665,556	—258,974
Spokane, Portland & Seattle	June	554	406,962	145,486	620,914	82,873	107,778	11,622	213,708	21,299	446,467	71.90	174,447	98,012	122,749	141,120
	6 mos.	554	2,538,244	646,154	3,584,067	438,885	647,099	61,428	1,157,486	127,214	2,479,287	69.20	1,104,780	654,121	527,293	910,813
Tennessee Central	June	296	208,238	36,386	259,611	42,790	31,529	7,570	89,428	11,610	182,875	70.40	76,736	67,106	48,541	20,293
	6 mos.	296	1,181,468	214,103	1,487,735	261,229	243,949	44,125	551,772	65,514	1,166,193	78.40	321,542	286,105	168,608	222,256
Terminal Railroad Assoc. of St. L.	June	37	.....	.....	398,779	103,237	43,915	1,090	134,458	8,183	294,478	73.80	104,301	33,237	131,469	134,207
	6 mos.	37	.....	.....	2,502,827	403,201	254,176	5,761	927,979	52,458	1,663,814	66.50	839,013	464,816	1,063,283	831,204
East St. Louis Connecting	June	1	.....	.....	161,892	39,283	12,664	346	59,196	4,944	116,433	71.90	45,459	39,849	20,046	34,054
	6 mos.	1	.....	.....	1,121,845	135,925	68,248	1,821	423,957	17,797	647,748	57.70	474,097	439,703	313,430	293,462
St. L. Merchants' Bridge Term.	June	9	.....	.....	369,947	99,788	28,150	1,033	158,586	6,749	294,306	79.60	75,641	46,415	48,399	9,864
	6 mos.	9	.....	.....	2,361,930	457,566	161,139	5,446	1,083,282	46,162	1,753,595	74.20	608,335	442,267	441,663	296,943
St. Louis Transfer Ry	June	6	.....	.....	55,913	19,342	6,076	186	30,064	3,698	59,366	106.20	—3,453	—3,836	—9,481	199
	6 mos.	6	.....	.....	392,275	66,119	32,370	981	221,408	9,702	330,580	84.30	61,695	59,284	23,853	10,414
Toledo, Peoria & Western	June	247	94,219	21,511	127,606	28,496	24,929	2,267	63,325	7,376	126,393	99.00	1,213	—4,792	—8,478	11,528
	6 mos.	247	562,203	150,081	774,899	152,664	224,143	13,560	414,884	42,126	847,299	109.30	—72,400	—108,452	—148,405	16,689
Trinity & Brazos Valley	June	368	130,785	11,416	147,955	62,600	49,487	4,097	75,527	10,909	202,573	136.90	—54,618	—62,274	—79,988	—98,442
	6 mos.	368	1,304,237	67,981	1,419,710	341,551	301,377	22,841	633,844	72,942	1,369,841	96.50	49,869	3,042	—175,861	—462,799
Ulster & Delaware	June	128	65,526	25,384	132,114	26,159	15,445	1,813	61,146	6,257	110,820	83.90	21,294	15,794	10,456	6,587
	6 mos.	128	316,014	78,901	598,282	106,507	110,757	11,418	311,348	37,693	577,723	96.60	20,559	—12,443	—33,208	—13,129
Union Railroad of Penna	June	45	.....	.....	1,013,279	125,732	241,818	181	389,402	11,904	769,037	75.90	244,242	214,293	270,972	136,951
	6 mos.	45	.....	.....	5,675,373	580,589	1,529,517	1,069	2,552,463	60,761	4,724,399	83.20	950,974	836,025	1,126,565	499,698
Union Pacific	June	3,687	5,664,726	1,721,483	8,302,947	1,139,956	1,545,765	216,255	2,093,103	276,188	5,497,354	66.20	2,805,593	2,280,373	2,202,161	1,431,474
	6 mos.	3,687	32,535,471	7,937,112	44,934,718	5,098,653	9,803,617	1,024,942	12,880,989	1,687,133	31,461,232	70.00	13,473,486	9,568,360	9,460,471	9,507,601
Oregon Short Line	June	2,444	1,876,155	477,378	2,570,390	532,901	458,405	54,142	767,873	107,188	1,984,828	77.20	585,562	358,313	313,494	333,760
	6 mos.	2,426	11,319,180	2,214,121	14,664,411	2,518,015	2,890,336	307,995	4,778,087	658,813	11,479,336	78.30	3,185,075	1,730,711	1,535,052	1,921,178
Oregon, Wash. R. R. & Nav. Co.	June	2,237	1,632,735	474,257	2,351,557	464,909	351,799	73,574	809,297	113,545	1,849,079	78.60	502,478	332,469	237,361	196,601
	6 mos.	2,237	9,102,530	2,149,761	12,417,274	2,374,578	2,132,983	403,646	4,950,511	679,900	10,716,563	86.30	1,700,711	680,441	200,914	1,295,195
Los Angeles & Salt Lake	June	1,207	1,320,226	581,966	2,119,529	284,585	356,305	74,570	658,311	63,666	1,526,602	72.00	592,927	458,266	380,962	325,613
	6 mos.	1,207	8,409,154	2,395,000	11,488,015	1,869,200	2,294,251	415,819	3,886,132	389,246	9,256,577	80.60	2,231,438	1,402,048	967,455	1,355,060
St. Joseph & Grand Island	June	258	191,216	18,369	229,538	56,157	61,036	3,026	88,779	11,866	220,864	96.20	8,674	1,366	—9,520	—15,366
	6 mos.	258	1,318,313	115,716	1,531,608	284,443	273,171	17,127	570,925	72,204	1,218,373	79.50	313,235	223,083	153,142	98,638
Utah	June	102	102,183	97	103,409	17,017	38,248	334	21,914	7,124	84,627	81.80	18,782	9,440	10,881	13,591
	6 mos.	102	762,088	1,902	769,157	82,274	240,689	2,171	179,181	36,652	540,957	70.30	228,200	183,974	149,929	67,971
Virginian	June	545	1,358,886	50,651	1,514,009	269,012	350,750	13,728	357,229	36,433	1,017,823	67.20	496,186	386,632	412,982	450,213
	6 mos.	545	8,173,392	348,549	9,180,913	1,417,424	2,074,374	77,158	2,223,084	202,564	5,955,149	64.90	3,225,764	2,520,262	2,633,929	2,372,255
Wabash	June	2,524	4,350,454	863,020	5,616,730	878,243	1,034,026	150,608	1,980,680	164,067	4,239,819	75.50	1,376,911	1,143,793	872,430	501,715
	6 mos.	2,524	26,219,331	4,254,167	32,873,049	4,603,193	6,211,544	879,004	12,616,193	979,146	25,456,703	77.40	7,416,346	6,019,136	4,357,738	3,127,043
Western Maryland	June	804	1,407,240	52,987	1,525,619	217,964	324,272	39,531	427,559	44,454	1,063,665	69.70	461,954	396,954	354,175	238,978
	6 mos.	804	8,707,635	324,208	9,484,883	1,265,207	2,042,388	225,585	2,850,052	271,429	6,719,193	70.80	2,765,690	2,385,690	2,075,689	1,788,105
Western Pacific	June	1,042	866,918	258,964	1,207,924	220,432	199,680	39,488	334,859	36,999	862,901	71.40	345,023	266,121	367,510	90,118
	6 mos.	1,042	4,865,902	914,235	6,202,668	1,080,025	1,201,337	226,331	2,264,108	215,389	5,107,004	82.30	1,095,664	621,155	1,268,681	512,658
Wheeling & Lake Erie	June	511	1,636,751	46,991	1,800,362	289,431	366,592	30,063	492,278	60,022	1,240,737	68.90	559,625	416,659	407,349	51,586
	6 mos.	511	8,670,518	290,610	9,544,596	1,183,809	2,303,152	175,898	2,996,375	274,034	6,947,731	72.80	2,596,865	1,833,566	1,821,299	1,097,418

General News Department

(*Continued from page* 325)

few days previous by Arthur Cardin, Minister of Marine and Fisheries at Ottawa. Mr. Cardin declared that something must be done to relieve the people of the burden of taxation caused by the Canadian National, and intimated that something would be done by the present government at Ottawa to relieve that burden.

This was construed by Mr. Meighen as an attack upon the public ownership of the Canadian National, and he charged the present government with raising this railway issue to overshadow that of the tariff on which he would like the next federal election to be waged. What Mr. Cardin had in mind was more clearly stated at the end of last week by Hon. George P. Graham, Minister of Railways and Canals at Ottawa, who said, "What is being done is in line with my statement to Parliament when the railway estimates were brought down. I then said that I was going to ask the two railways to get together as much as possible and try to come to some arrangement of co-operation that would include, not only passenger traffic, but an exchange of freight on an equality basis that would prevent duplication. To that end, and with a view to reducing expenditure, we are endeavoring to secure co-operation of the two lines.

"What will be the outcome of these proposals no one knows yet, but no scheme of amalgamating the systems has been considered."

No Action on Proposed Lease of Edmonton, Dunvegan & British Columbia

After a week of debate the Alberta Legislature prorogued without reaching a decision on the main question before it, which was the renewal of the lease of the Edmonton, Dunvegan & British Columbia, owned by the Alberta government. Five years ago it was leased to the Canadian Pacific, and that lease expired on July 20 last. Premier Herbert Greenfield called the Legislature to meet on August 3 to consider the offers of the Canadian Pacific and Canadian National for a new lease. The Premier told the Legislature at its first sitting that the government would take no action in regard to the acceptance of either offer until more satisfactory terms have been arranged with the Royal Bank of Canada. The capital stock of the Edmonton road was held by the Union Bank of Canada, but is now held by the Royal Bank, which recently absorbed the Union Bank, the bank holding the stock for the J. D. McArthur Company, which constructed the road, as their assigns. The Alberta government is the guarantor of certain bonds secured by a trust deed mortgage to the National Trust Company of Toronto. Premier Greenfield also stated that the original offer of the Canadian Pacific, through President E. W. Beatty, has been amended, raising the annual cash payment from $50,000 to $60,000.

Sir Henry Thornton's offer, he stated, provided for a 25-year lease at a nominal charge of one dollar a year, the Alberta government to pay all existing fixed charges. The Canadian National, in return, would make at their own expense any capital improvements necessary to the property. In addition to the dollar-a-year rental, the Canadian National would pay one-half of the operating profits, if any, to the Alberta Government, and that road also offered to put the prairie freight rates in effect on the Dunvegan line at once. As for the Pacific Coast outlet to the Peace river country, Premier Greenfield said Sir Henry Thornton stood by his original offer to build it when the export grain from the Peace river area reaches 10,000,000 bushels annually for three successive years. The question of land grants would be considered at that time. Sir Henry also offered to enter into a joint operating agreement with the Canadian Pacific. Later last week during the sitting of the Legislature both roads improved their offers. Premier Greenfield stated he had received advice from both roads that they would undertake to give to the Peace river country the benefit of a prairie freight rate basis for a limited period, pending the conclusion of satisfactory terms with the Royal Bank.

The Premier last Thursday afternoon announced in the Legislature that the offer of the Royal Bank to accept $1,700,000 for the $2,000,000 par value common and debenture stock in the Dunvegan road would not be recommended to the government by himself, and the government would make no final disposition of the Peace river railway question until they received a better agreement with the bank.

Traffic News

The Women's Traffic Club of Los Angeles held its regular meeting on August 5, with an address by Norman F. Titus of the McCormick Steamship Company.

This Saturday (August 15) the doors will be closed by the Dominion Railway Board at Ottawa to any further submissions charging rate discrimination, and the Board will then proceed to a study of the voluminous memoranda received before outlining a tour of the Dominion in the fall to deal with the question of freight rate discrimination as instructed by the last session of Parliament.

E. R. Bruce, director of exhibits of the Canadian Pacific, announced in Toronto last week that his company would have an elaborate exhibit at the New Zealand Exhibition to be held this year at Dunedin, N. Z. The main object of the Exhibition, said Mr. Bruce, was to foster inter-Imperial trade, and a large part of the Canadian Pacific exhibit will be mechanical and scenic paraphernalia featuring the "all-red route."

The pineapples from Cuba brought north over the Southern Railway during the present year have amounted to 2,700 carloads, all received at Jacksonville, Fla., from the Florida East Coast, to which road they were brought by the Key West ferry. More than half of these cars were subjected to orders for diversion while in the custody of the Southern. Almost half of the shipments—1,346 cars—were moved through Cincinnati; and 414 through Potomac Yards.

Increased freight rates on grain from Iowa, Minnesota, South and North Dakota, Wisconsin and Illinois points, which were to be put into effect on August 10 by the Chicago, Milwaukee & St. Paul, the Chicago, Rock Island & Pacific, the Great Northern, the Minneapolis & St. Louis and the Chicago, St. Paul, Minneapolis & Omaha, have been suspended pending an investigation by the Interstate Commerce Commission. A hearing has been ordered but no date specified. The action followed protests made to the commission by grain associations of the northwest against the new tariffs which had been filed with the commission by the carriers.

The Chicago & Alton has placed in service a new train between Chicago & St. Louis, Mo., known as the Lincoln Limited. It leaves Chicago and St. Louis at 3 p. m. daily and arrives at 10:30 p. m. With the exception of the Pullman equipment the cars are the former Alton Limited cars, which were rebuilt in the shops at Bloomington, and are named after central Illinois cities. The chair cars are named the Dwight, the Chenoa, the Alton and the Joliet. The combination baggage and smoking cars are named after Carlinville and Atlanta. The diners are the Peoria, the Pekin and the Monticello, the latter having been named from a girl's seminary at Godfrey.

The New York Central has asked the New York State Public Service Commission for authority to discontinue Lewiston as a passenger station after September 27. Lewiston, 5½ miles north of Suspension Bridge, has little passenger traffic in the cold season and passenger trains were not run north of Suspension Bridge last winter. In the summer there is considerable traffic, but the railroad company made a count between July 10 and July 20, this year, and found that it was getting less than five per cent of the business. The electric line, the "Gorge Route," carried 41,964 passengers; bus lines 5,021 and the New York Central 2,179. There are five trains a day each way on the New York Central, making the average train load 22 passengers.

THE GREEK STATE RAILWAYS showed a profit during 1923-24 for the first time in their history. Receipts amounted to 209,086,763 drachmas and expenditures to 170,585,741 drachmas, compared with 95,657,977 drachmas and 100,942,943 drachmas, respectively, in 1922,23. The present rate of the drachma is about 2 cents.

Commission and Court News

State Commissions

The Public Service Commission of New York will hold a hearing in New York city on August 19 on the application by Westchester County commuters for a rehearing on the recent order authorizing an advance in season ticket passenger rates on the New York, New Haven & Hartford.

Court News

Hauling Coal as Interstate Commerce

The Circuit Court of Appeals, Eighth Circuit, holds that hauling coal from mines for its own use by a railroad wholly intrastate as to its lines and termini, but which also hauls coal from the mines in interstate commerce, is "interstate commerce" in a suit to enjoin discrimination in furnishing empty coal cars to certain of the mines.—Freeman v. United States, 4 F. (2d) 13.

Inspection of Company's Books in Action for Discrimination

In an action by a shipper alleging discrimination in furnishing cars, the federal district court for northern California holds that allowing the plaintiff to inspect certain books, containing the daily car order record, with the order for cars, the orders placed, and the cars placed, was sufficient compliance with an order to allow the plaintiff to inspect the company's books so that he might furnish a bill of particulars. Plaintiff was not entitled to go into the company's records to ascertain why the discrimination, if any, was made.—P. H. McGarry & Co. v. Southern Pacific, 4 F. (2d) 421.

Effect of Change of Rates on Contract to Ship Timber

A contract was made in 1888 under which a railroad company sold land and timber to a lumber company, the latter agreeing to ship over the company's lines 60 per cent of the lumber made from logs cut. The road agreed to transport logs at $1 per 1,000 ft. Subsequently the log rates were raised by the federal and state authorities. The Circuit Court of Appeals, Ninth Circuit, holds that the change of rates did not destroy the contract, but modified its terms consistently with what presumably the parties incorporated therein. The road could not be held liable on the contract to refund the difference between the contract rate and the established rate. The court stated a basis of accounting between the parties.—Northern Pacific v. St. Paul & Tacoma Lumber Co., 4 F. (2d) 359.

Waiver of Liability in Free Pass—Removal of Cause to Federal Court

E, an inspector of ties in the employment of a tie company, whose duty it was to inspect and receive cross-ties made and delivered by others on a railroad's line worked in conjunction with A, an inspector for the railroad. The tie company paid for the ties based on E's inspection, and was paid on the inspection of A. They used a motor-car on inspection trips made to adjust discrepancies between them, E signing a waiver of liability for injuries. He was seriously injured when the car struck a hog and was wrecked, and sued the Director General, contending that the pass in this instance was issued for a valuable consideration, and the waiver was void. The Circuit Court of Appeals, Fifth Circuit, holds that the stipulation was valid, the arrangement being chiefly, if not entirely, for the benefit of the tie company and the plaintiff.

The plaintiff, his co-plaintiff, an insurance company, and the railroad were all residents of different states. It was therefore held that the action was removable by the director general from the state court to the federal court for diversity of citizenship.—Ellis v. Davis, 4 F. (2d) 323.

Equipment and Supplies

Locomotives

THE W. B. HARTESON LUMBER COMPANY has ordered one Prairie type locomotive from the Baldwin Locomotive Works.

THE COMMONWEALTH STEEL COMPANY has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE INTERNATIONAL GREAT NORTHERN.—A program of improvement includes $460,000 for rebuilding locomotives, cars and other equipment.

THE CENTRAL OF GEORGIA has ordered 10 Santa Fe type locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of July 11.

Freight Cars

THE OLIVER IRON MINING COMPANY is inquiring for 200 ore cars.

THE WARNER SUGAR COMPANY, Cuba, is inquiring for 75 cane cars.

THE ILLINOIS CENTRAL is inquiring for 1,000 single sheathed automobile box cars of 40 tons' capacity.

THE ANGLO MEXICAN PETROLEUM COMPANY has ordered 17 tank cars of 7,080 gal. capacity from the Middletown Car Company.

M. K. NORTHAN has ordered for the Roseville Company 5 tank cars of 40 tons' capacity, from the American Car & Foundry Company.

THE GLEN NINA TANK LINE, Buffalo, N. Y., has ordered two triple-compartment, 6,000 gal. capacity tank cars from the Standard Tank Car Company.

THE GULF COAST LINES.—The improvement program includes the purchase of 500 steel underframe box cars, 250 steel underframe gondola cars and $230,000 for dining cars.

THE MATHESON ALKALI WORKS have ordered 20 tank cars with 30-ton trucks and 15-ton liquid chlorine tanks, from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of August 8.

Passenger Cars

THE SOUTHERN RAILWAY is inquiring for 10 steel horse cars 70 ft. long.

THE DELAWARE, LACKAWANNA & WESTERN is inquiring for 15 steel through line coaches.

THE COLUMBUS, DELAWARE & MARION ELECTRIC COMPANY has ordered 2 steel parlor cars from the American Car & Foundry Company.

THE SOUTH AUSTRALIAN RAILWAYS have ordered from the J. G. Brill Company 25 combination passenger and baggage gasoline rail motor cars.

THE SEABOARD AIR LINE has ordered 4 combination baggage and mail cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of July 18.

Iron and Steel

THE GREAT NORTHERN has ordered 4,020 tons of structural steel from the American Bridge Company.

THE ILLINOIS CENTRAL has ordered 138 tons of structural steel from the McClintic Marshall Company.

THE MICHIGAN CENTRAL has ordered 135 tons of structural steel from the American Bridge Company.

THE LOUISVILLE & NASHVILLE has ordered 1,250 tons of structural steel from the McClintic-Marshall Company.

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered 228 tons of structural steel from the American Bridge Company.

THE KANSAS, OKLAHOMA & GULF has ordered 159 tons of structural steel from the Wisconsin Bridge Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered 100 tons of structural steel from the McClintic Marshall Company.

THE CENTRAL OF NEW JERSEY has ordered 4,600 tons of steel for its Newark Bay bridge, from the Bethlehem Steel Company.

THE LOUISVILLE, HENDERSON & ST. LOUIS has ordered 3,000 tons of rail from the Illinois Steel Company and 180 tons of structural steel from the American Bridge Company.

Machinery and Tools

THE ATLANTIC COAST LINE has placed an order for a 7½-ton, 60-ft. span traveling crane.

THE UNION PACIFIC is inquiring for one 2-ft. radial drill, one 18-in. engine lathe and one double-emery grinder.

THE HAVANA CENTRAL has ordered a 96-in., 600-ton wheel press, from the Niles-Bement-Pond Company.

THE NEW YORK, CHICAGO & ST. LOUIS has placed an order for an axle lathe and a 36 in.-44 in. side head boring mill.

THE PULLMAN CAR & MANUFACTURING CORPORATION has ordered a 48 in., 500-ton wheel press, from the Niles-Bement-Pond Company.

THE CHESAPEAKE & OHIO has ordered one 15-ton electric overhead traveling crane from the Manning, Maxwell & Moore-Shaw Electric Crane Works.

THE ILLINOIS CENTRAL is inquiring for one hand power combination punch and shear, one engine lathe, one heavy duty crank shaper and one combination double head grinder for grinding twist drills up to two inches.

Track Specialties

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS is inquiring for 6,000 angle bars.

Signaling

Union A. T. C. on 84 Miles of the Pennsylvania

The Pennsylvania has contracted with the Union Switch & Signal Company to furnish material for the installation of the Union three-indication continuous automatic train stop system for its line between Baltimore, Md., and Harrisburg, Pa., 84 miles, double track. Alternating current polarized track circuits will be used throughout. Both the signal and train control energy will be 100 cycles, and will be fed from sub-stations at York, Lemoyne and Baltimore. A total of 162 locomotives will be equipped for operation over this division, and the train stop apparatus for these engines, together with the necessary position light signals and a.c. track circuit materials, will be supplied by the signal company.

New York Central A. T. C. Program

As noticed in the *Railway Age* of last week, the New York Central has contracted with the General Railway Signal Company for the material for automatic train control on 871 miles of road in the New York Central System, the largest contract of the kind thus far reported. Much of this road is four-track, and both freight and passenger tracks are included in the plans. This system, the "auto-manual inductive intermittent type" was described in detail in the *Railway Age* of June 13, page 1455, in a carefully prepared article by W. J. Eck.

The wayside element consists of a U-shaped magnet fixed 20½ in. outside the rail and standing 2½ in. above the top of the rail. The receiver, which is mounted on a truck of the tender of the locomotive, passes about 2 in. above the surface of the inductor. There is an inductor in the rear of every signal and the wayside circuits controlling it are simple modifications of existing signal circuits.

The design of the receiver is such as to permit operation of an engine of any one of the four railroads over all of the lines. Not only does this design permit operation of steam engines in steam territory, but in all electrically operated territories as well. The train-stopping equipment provides for one direction (forward) operation of the unit. The inductors (roadside elements) are located well within the clearance requirements of all engines and cars. No centrifuge or speed governor is provided.

The installation of equipment on the engines and roadway will be made by the railroad forces. The installation program provides for carrying on the work on all the four railroads at the same time, and for completing the work by July 18, 1926. All main line passenger and freight tracks, within the territories defined, will be equipped with the system.

Seven operating divisions, two on each of the three lines, and one on the fourth (the B. & A.) will be equipped. The divisions selected are those covered by I. C. C. orders of June 13, 1922, and, as to the three large lines, the order of January 14, 1924.

The mileage in detail is as follows:

	Engines	Miles Road	Miles Track
Boston & Albany			
Springfield—Rensselaer	146	100	234
Cleveland, C., C. & St. L.			
Main line, Mt. Jackson (Indianapolis)—Lenox (E. St. Louis)	162	249	391
Michigan Central			
Main line, West Detroit—Niles	250	191	382
New York Central			
Albany—Syracuse	342	148	675
Buffalo—Cleveland	265	183	716
	1,165	871	2,398

The Interstate Commerce Commission has been petitioned to relieve the Boston & Albany of the requirement for the installation of a train control system between Boston and Springfield, pending determination of results of operating these devices on the eight other divisions of the New York Central Lines.

The initial installations of General Railway Signal Company's continuous control which have been installed on the Boston & Albany, the Cleveland, Cincinnati, Chicago & St. Louis, and the Michigan Central, as well as the Sprague Safety Control & Signal Corporation's intermittent inductive system on the Mohawk Division of the New York Central, are to be taken out of service, and the auto-manual inductive intermittent system substituted. These initial installations are located within the limits of the first I. C. C. order.

LOCOMOTIVE REPAIR SITUATION

Date, 1924	No. locomotives on line	No. serviceable	No. stored serviceable	No. req. classified repairs	Per cent	No. req. running repairs	Per cent	Total req. repairs	Per cent
February 1	64,377	53,586	4,116	5,919	9.2	4,872	7.6	10,791	16.8
April 1	64,363	52,805	4,648	6,128	9.5	5,430	8.4	11,558	17.9
July 1	64,416	53,382	7,117	6,035	9.4	4,999	7.7	11,034	17.1
October 1	64,538	53,209	5,424	6,175	9.6	5,154	8.0	11,329	17.6
January 1, 1925	64,384	53,118	4,849	5,927	9.2	5,339	8.3	11,266	17.5
February 1	64,308	52,994	4,220	6,143	9.6	5,171	8.0	11,314	17.6
March 1	64,255	52,851	4,988	6,217	9.7	5,187	8.0	11,404	17.7
April 1	64,230	52,619	6,241	6,345	9.9	5,266	8.2	11,611	18.1
May 1	64,034	52,933	6,697	6,082	9.5	5,019	7.8	11,101	17.3
June 1	63,976	53,074	6,618	5,916	9.2	4,986	7.8	10,902	17.0
July 1	63,942	53,025	6,600	5,832	9.1	5,085	8.0	10,917	17.1

Data from Car Service Division reports.

Supply Trade News

The Northern Conveyor & Manufacturing Company has moved its main office from Milwaukee, Wis., to Janesville.

Robert L. Nutt, Jr., Norfolk, Va., now represents **Robert H. Blackall** of Pittsburgh and New York for the sale of the Lawson pipe wrench to railroads in Norfolk and adjacent territory.

Percy M. Brotherhood, formerly first vice-president of Manning, Maxwell & Moore, Inc., has opened an office at 25 Church street, New York City, specializing in machine tools and specialties.

Edgar J. Correll, formerly division engineer of the Baltimore & Ohio, with headquarters at Akron, Ohio, has been appointed vice-president of the **Anchor Company,** with headquarters in a newly opened office in Chicago. He was born in Canton, Ohio, and was educated at Ohio Northern University. He entered railway service in September, 1896, as a rodman on an engineering corps on the Baltimore & Ohio Southwestern, now a part of the Baltimore & Ohio, and in 1897 was promoted to assistant engineer. In March, 1898, he became a draftsman, which position he held until March, 1903, when he was promoted to assistant division engineer. He was promoted to division engineer in March, 1903, with headquarters at Chillicothe, Ohio, and was later transferred to Akron, Ohio, which position he has held until his recent appointment.

E. J. Correll

Cornell Iron Works, Inc. has removed its main office and factory to 71-79 Marion street, Long Island City, N. Y. A branch office will be retained at 601-5 West Twenty-sixth street, New York City.

A. G. Graves, sales manager of the Massillon Bridge & Structural Company, Massillon, Ohio, has resigned to take charge of sales and engineering of the structural department of the **Morgan Engineering Company,** Alliance, Ohio.

The Milwaukee Electric Crane & Manufacturing Company, Milwaukee, Wis., has appointed **Ridenour, Seaver & Kendig** its representative at Pittsburgh, Pa., **Page & Ludwich** at Chicago, and the **George C. Crivell Company, Inc.,** at Buffalo, N. Y.

The Lenoir Car Works, Lenoir City, Tenn., has placed a contract with the Converse Bridge & Steel Company, Chattanooga, Tenn., for the construction of car erecting and steel fabricating shops 800 ft. by 125 ft. to take the place of a structure recently burned. The new building, which will be of steel construction, will be completed in 90 days and will be equipped with new machinery.

The Weir Frog Company, Cincinnati, Ohio, and the **Kilby Frog & Switch Company,** Birmingham, Ala., have been consolidated through the purchase of the stock of W. W. Stringfellow, president of the Kilby Frog & Switch Company, by the Weir Frog Company. The two plants will be operated separately. **E. M. Kilby,** vice-president of the Kilby Frog & Switch Company, has been appointed president and general manager of the Birmingham plant.

The General American Tank Car Corporation, Chicago, has made the following appointments in its tank car sales department: **R. J. Sharpe,** general western sales manager, with headquarters at Tulsa, Okla.; **M. A. Sticelber,** sales representative, Tulsa, Okla.; **Bennett Epstein,** general eastern sales manager, New York City; **R. T. Musser,** Pacific coast sales manager, with headquarters at Los Angeles and San Francisco, Cal., and **Z. R. Simon,** southern sales manager, New Orleans, La.

Convention of National Industrial Advertisers' Association

The annual meeting of the National Industrial Advertisers' Association will be held at the Chalfonte Hotel, Atlantic City, on October 19-21. President Julius Holl, of the Link-Belt Company, has announced the appointment of the following committees: General Chairman of the Convention and Chairman of the Program Committee in general, W. A. Wolff, Western Electric Company, New York; Chairman Exhibit Committee, D. J. Benoliel, International Chemical Co., Philadelphia; Chairman "on-to-Atlantic City" Committee, J. N. McDonald, Anaconda Copper Mining Co., New York; Chairman Entertainment Committee, Hoyt Catlin, Bryant Electric Co., Bridgeport, Conn.; Chairman Transportation Committee, H. W. Downes, American Locomotive Co., New York. The General Committee consists of W. A. Wolff, Chairman, Western Electric Co., New York; J. L. Ashcroft, Ludlow-Saylor Wire Co., St. Louis; Joseph C. Bowman, Penton Building, Cleveland, O.; Ezra Clark, Clark Tructractor Co., Buchanan, Mich.; O. C. Dahlman, Koehring Company, Milwaukee, Wis.; W. S. Hays, National Slate Assn., Philadelphia; J. N. McDonald, Anaconda Copper Mining Co., New York; A. M. Staehle, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

Audit Bureau of Circulations Meeting

The annual "A. B. C. Week" will take place in Chicago on October 12-17. The convention proper of the bureau will be called to order on October 15 at the La Salle Hotel. Other organizations which will hold meetings during "A. B. C. Week" are the Inland Daily Press Association, the Associated Business Papers, Inc., the Agricultural Publishers Association and the Association of Foreign Language Newspapers. The Western Council of the American Association of Advertising Agencies will be hosts to the publishers at a luncheon. The A. B. C. annual dinner is scheduled for October 16.

Obituary

William McConway, president of the McConway & Torley Company, who died on July 28, in St. Francis hospital, Pittsburgh, Pa., as was noted in the *Railway Age* of August 8, was born in Ireland on February 14, 1842. He came to the United States in 1849 and attended the public schools until he was 12, when he went to work with the Novelty Iron Works. Six months later he entered the service of Olhausen & Crawford, manufacturers of malleable iron castings, remaining with that company until September, 1861, when he entered the United States Army as a private and served through the Civil War; during this service he was promoted to sergeant-major, and in July, 1863, was commissioned a second lieutenant. In September, 1864, he returned to civil life and resumed his employment with Olhausen & Crawford, in 1866 becoming a junior partner

William McConway

of this firm. In 1869 he organized the present business under the firm name of Lewis & Company and became its general manager. The following year the name was changed to the McConway & Torley Company, and in 1892 the firm was incorporated. Mr. McConway was a pioneer in the development of the automatic coupler. He had served as a director of numerous corporations including that of the Westinghouse Electric & Manufacturing Company. He was also a trustee of the Carnegie Institute and the Carnegie Institute of Technology.

W. M. Camp, Editor of Railway Review, Dies

Walter Mason Camp, editor in chief of the Railway Review, Chicago, died in a hospital at Kankakee, Ill., on August 3, of Bright's disease. His death was sudden and occurred after it was thought a cure had been effected. Mr. Camp was born on April 21, 1867, at Campstown, Pa. In 1883, after he had spent four years working on farms and in the lumber woods, he was employed on the Lehigh Valley as a track walker and later as a chainman and rodman in the office of the division engineer. In 1887 he left railway service to resume his education, entering the course in civil engineering at Pennsylvania State College.

W. M. Camp

He was graduated in 1891, after which he was employed as a surveyor on the Southern Pacific and as a draftsman in the office of the chief engineer at San Francisco. Mr. Camp was placed in charge of construction of the Rainier Avenue Electric Railway in Seattle, Wash., in 1892, and was later promoted to superintendent in charge of operation and maintenance. In 1894 and 1895 he was employed as a work train foreman, surveyor and section foreman on the Seattle, Lake Shore & Eastern, but he left that company in 1895 to take a post graduate course in electrical and steam engineering at the University of Wisconsin. For a short time in 1896, Mr. Camp was an instructor in electricity in the National School of Electricity, Chicago. Later in the same year he was appointed inspector of track construction of the Englewood and Chicago electric railway, later being promoted to superintendent of track construction. During this time he had charge of the construction of a counter weight system at Morgan Park, Chicago. Mr. Camp was first employed on the Railway and Engineering Review, the predecessor of the Railway Review, in 1897, as engineering editor. He was later promoted to managing editor and then to editor in chief. Although he had been in ill health for some time previous to his death, his connection with the Railway Review was continuously maintained. Mr. Camp was known as an authority on railway track and his "Notes on Track" issued in 1904 are still considered an important contribution to the literature on the subject. He also collaborated as author of a book on railroad transportation at the St. Louis exposition.

THE LOS ANGELES (CALIFORNIA) COUNTY GRADE CROSSING COMMITTEE has condemned railway crossing gates as too slow and ponderous for present day traffic, and has recommended that signal lights be used instead.

THE DAM AT LAKE KENOGAMI, Quebec, Canada, is expected to be completed early in September. It is estimated that 12,000,000 cu. ft. of water are now stored at the lake. The dam when completed will have cost nearly $2,000,000.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—Bids were closed on August 14 for the construction of a water treating plant at Slaton, Tex., to cost $40,000. This company also closed bids on August 11 for the construction of a freight house at Las Vegas, New Mexico.

BALTIMORE & OHIO.—A contract has been awarded to the Sheesley & Janney Construction Company, Johnstown, Pa., for masonry work for three bridges to eliminate grade crossings at Greendale, Ill., to cost approximately $40,000.

CANADIAN NATIONAL.—A contract has been awarded to Dutton & Wikstrand, Winnipeg, Man., for the construction of stream diversions on the Lampman sub-division, Saskatchewan.

CENTRAL OF NEW JERSEY.—A contract has been awarded to the Bethlehem Steel Company for the furnishing and erection of the superstructure of a viaduct at the east end of the company's bridge over Newark Bay, now under construction.

CHESAPEAKE & OHIO.—A contract has been awarded to Haley, Chisholm & Morris, Charlottesville, Va., for the construction of a reinforced concrete underpass at Russell, Ky., to cost $60,000.

CHICAGO, MILWAUKEE & ST. PAUL.—Negotiations are now under way for the financing of the reconstruction of a grain elevator at Milwaukee, Wis., which was destroyed by fire last year. The cost of reconstruction, including machinery, is estimated at $300,000.

CHICAGO, ROCK ISLAND & PACIFIC.—The Interstate Commerce Commission has authorized the construction of two extensions, one from Liberal, Kan., southwest to Amarillo, Tex., a distance of 145 miles, and the other from Billings, Okla., northeast to Ponca City, a distance of approximately 30 miles.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—This company is inquiring for one continuous or twinspan type turntable.

COLORADO & SOUTHERN.—A loading dock to cost $25,000 will be constructed at Denver, Colo.

GULF COAST LINES.—Plans are being prepared for the construction at DeQueen, La., of a 38-ft. by 350-ft. car repair shop, a 140-ft. by 170-ft. metal shop, a machine shop and other buildings.

HOUSTON, BEAUMONT & ORANGE (Electric).—A contract has been awarded to W. H. Nichols & Co., Houston, Tex., for the construction of an interurban line from Houston, Tex., to Orange, a distance of 125 miles.

ILLINOIS CENTRAL.—A contract has been awarded to Emmet Stevenson, McComb, Miss., for the construction of a frame freight station at Brookhaven, Miss.

INTERNATIONAL-GREAT NORTHERN.—A contract has been awarded to W. C. Thrailkill, San Antonio, Tex., for the construction of a suburban passenger station at North San Antonio to cost $37,000, reported in the *Railway Age* of July 18.

INTERNATIONAL-GREAT NORTHERN.—The improvement program for this road includes $1,000,000 for relaying rail; $500,000 for ballasting; $275,000 for improving yards and sidings; $228,000 for the renewal of bridges; $30,000 for a copper telephone circuit; $70,000 for creosote and oil tanks and $55,000 for a suburban station at San Antonio, Tex., according to a statement made by H. R. Safford, executive vice-president.

MICHIGAN CENTRAL.—This company is asking for bids for a new steel superstructure for a bridge over the Cold Water river near Union City, Mich.

THE MICHIGAN CENTRAL.—A contract has been placed with the Ellington Miller Company, Chicago, for a one-story brick station at Detroit, Mich., to cost $300,000.

MISSOURI-KANSAS-TEXAS.—A contract for alterations to a one-story warehouse building at St. Louis, Mo., has been awarded to H. O. Hirsch & Co., St. Louis, Mo.

NEW YORK, CHICAGO & ST. LOUIS.—Preliminary surveys are being made in the vicinity of Bluffton, Ind., in contemplation of a series of line changes to eliminate curves. Decision has not yet been made as to whether the work will be undertaken.

PENNSYLVANIA.—A contract has been awarded to the Milliron Construction Company, Du Bois, Pa., for the construction of an overhead bridge to eliminate a grade crossing at Waterford, Pa. The Hecker-Moon Company, Cleveland, Ohio, has a contract for grading, masonry and track work for a spur track at Fultonham, Ohio, to cost approximately $150,000. A contract has been awarded to L. Schiavoni, Girard, Ohio, for masonry for a bridge over Liberty street, that city.

SOUTHERN PACIFIC.—A contract has been awarded to the Missouri Bridge & Iron Co. for the construction of a bridge over the Gila river at Wellton, Ariz.

SOUTHERN PACIFIC.—This company has awarded a contract for the construction of a bridge across the Gila river, near Wellton, Ariz., on the new main line across Arizona.

THE NATIONAL RAILWAYS OF MEXICO.—The Department of Communications at Mexico City has stated that branch lines in the state of Chiapas will be constructed at an approximate cost of $2,500,000.

UNION PACIFIC.—This company has awarded a contract to T. J. Sullivan, Denver, Colo., for the construction of a one-story storehouse at Council Bluffs, Iowa, to cost $60,000. A call for bids was reported in the *Railway Age* of July 11.

UNION PACIFIC.—A contract has been awarded to P. J. Sullivan, Denver, Colo., for the construction of a passenger station and freight station at Topeka, Kan., to cost a total of $400,000. This project was reported in the *Railway Age* of June 27.

WABASH.—Bids were closed on August 11 for the construction of a roundhouse and service building at North Kansas City, Mo., to cost $100,000. This company has also awarded a contract to Jerome A. Moss for the construction of a passenger station including paving, at Taylorville, Ill., to cost $48,000. A call for bids was reported in the *Railway Age* of July 25.

WYOMING NORTH & SOUTH.—All claims aggregating $8,000,000 against the Wyoming North & South which was to be constructed from Casper, Wyo., to Miles City, Mont., have been bought for $150,000 by Peterson, Shirley & Gunther, contractors, who were engaged to build the road.

Port Authority Proposes Nine Joint Freight Stations for New York

The Port of New York Authority has proposed the erection on Manhattan Island, New York, of nine freight stations for the use of all railroads. Freight would be received at the terminal yards of the various railroads and loaded into containers, which would be conveyed to the various new freight stations by motor truck. Outbound freight would be delivered by the shipper to the freight station nearest him and dispatched to any railroad designated by him in the same manner. Freight connection with Manhattan Island is now secured except for two roads largely by use of car floats, each railroad maintaining its own waterfront facilities. The plan advanced by the Port Authority would release these facilities for other service. The plan advanced is tentative, being put forward for the purpose of ascertaining the attitude of the railroads and shippers to it. Some time ago the Port Authority proposed a similar plan, providing, however, for connection with the railroad terminals by means of a subterranean automatic electric railway.

PRESENT INDICATIONS point to one of the best crop years western Canada has experienced in a decade, according to the weekly crop report of the Canadian Pacific Railway.

Railway Financial News

ANDALUSIA, FLORIDA & GULF.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon its line from Galliver, Fla., to Falco, Ala., 25.5 miles built in 1911 by the Florida & Alabama Land Company, later known as the Florida, Alabama & Gulf.

ATCHISON, TOPEKA & SANTA FE.—*Abandonment of Branch.*—This company and the California, Arizona & Santa Fe Railway have requested permission from the Interstate Commerce Commission to abandon the Crown King branch of the subsidiary company in Yavapai county, Ariz.

AUGUSTA UNION STATION.—*Final Valuation.*—The Interstate Commerce Commission has served a final report placing the value for rate-making purposes of the owned and used property of the company at $235,649, as of June 30, 1916.

CENTRAL OF GEORGIA.—*Bonds.*—The Central of Georgia has been authorized by the Interstate Commerce Commission to procure authentication and delivery of $3,314,500 of refunding and general mortgage 5½ per cent bonds.

CENTRAL PACIFIC.—*Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $40,000,000 of 35-year 5 per cent gold bonds to be sold at 95 per cent of par. The Southern Pacific was authorized to guarantee the issue.

CHESAPEAKE & OHIO.—*Control of Sandy Valley & Elkhorn.*—The Interstate Commerce Commission has approved the purchase from the Consolidation Coal Company of the Sandy Valley & Elkhorn for approximately $6,800,000 in cash. The line extends from the Chesapeake & Ohio's Big Sandy division at Shelby Junction, Ky., southwesterly to Dunham, 31 miles. It was formerly owned by the Baltimore & Ohio.

Purchase of Pond Fork & Bald Knob.—Announcement has been made that the Chesapeake & Ohio has purchased this company, which operates a line of railroad from West Junction, W. Va., to Barrett.

CHICAGO & NORTHWESTERN.—*Equipment Certificates.*—This company has applied to the Interstate Commerce Commission for authority to guarantee $5,415,000 of 4½ per cent equipment trust certificates to be sold to the highest bidder but at not less than 97 per cent of par. The proceeds will be applied to the purchase of equipment costing $7,235,729. The issue will be dated October 1 next and will mature in 15 annual installments.

CHICAGO, MILWAUKEE & ST. PAUL.—*Equipment Certificate Issue.*—The receivers of this company have requested authority from the Interstate Commerce Commission to guarantee an issue of $9,270,000 of 5 per cent equipment trust certificates to be sold at not less than 97 per cent of principal to Kuhn, Loeb & Co. and the National City Company. The proceeds will be applied to the purchase of equipment costing $12,360,000. The issue will be dated August 1, 1925, and will mature in annual installments of $618,000 from August 1, 1926, to August 1, 1940.

Trackage Rights.—The receivers have been authorized by the Interstate Commerce Commission to operate under a trackage agreement over the line of the Northern Pacific from St. Paul to Carlton and thence to Dubuque, including the branch from Carlton to Cloquet, Minn., and from Duluth, Minn., to West Superior, Wis., 213 miles, together with terminal facilities at the head of the lakes. In 1900, the two railroads entered into an agreement whereby the Northern Pacific agreed to handle traffic of the St. Paul over this line. The present arrangement follows as a result of the exercise of rights embodied in the 1900 agreement. The St. Paul is restricted from taking any freight or passenger business or switching for other companies at intermediate points between St. Paul and Minneapolis and the head of the lakes or within the district defined as the head of the lakes. The mileage in question has been included in the St. Paul mileage statement and has been shown on its maps.

DENVER & SALT LAKE.—*Reorganization Plan.*—Committees representing the holders of first mortgage and adjustment mortgage

bonds of the Denver & Salt Lake have appointed a reorganization committee, of which Gerald Hughes, Denver, Colo., is chairman, with a view to the reorganization of the company at an early date.

Under the plan of reorganization the first mortgage 4 per cent bonds, outstanding to the amount of $10,514,000, and the $2,000,000 adjustment income 5 per cent bonds will be retired, and new first mortgage bonds and income bonds will be issued in their place.

Each holder of the present first mortgage bonds will receive $200 face amount of new first mortgage bonds, $1,000 face amount of new income bonds and two shares of new stock for each bond deposited and on payment of $200. Without any cash payment the plan calls for payment of $666⅔ face amount of new income bonds and one share of new stock for each of the old first mortgage bonds.

For each $1,000 of adjustment bonds now held, holders will receive $200 face amount of new first mortgage bonds and five shares of new stock on payment of $200. Failure of income bondholders to pay cash disentitles them to participate in the plan. Both classes of bondholders who decide on making cash payments must pay in 10 per cent of the cash required by September 10, 1925, 30 per cent within ten days after the plan is operative and the balance on call of the reorganization committee. Bonds must be deposited by September 15 with the depositaries, Seaboard National Bank, New York, and The International Trust Company, Denver, Colorado.

GULF, COLORADO & SANTA FE.—*Valuation.*—A tentative valuation of $54,800,000 has been placed by the Interstate Commerce Commission on the property of this company owned and used for common carrier purposes as of June 30, 1916. The valuation of the owned property was fixed at $55,787,816 and of the used property at $69,256,070. Capitalization as of valuation date was reported as $55,052,082, and book investment in road and equipment as $44,955,758, which the Commission's report reduces to $43,489,950. The cost of reproduction new of the used property was estimated at $66,406,214 and cost of reproduction less depreciation at $54,770,348.

MIDLAND & NORTHWESTERN.—*Abandonment by Texas & Pacific.*—The Interstate Commerce Commission has authorized the Texas & Pacific to abandon the Midland & Northwestern, extending from Midland, Midland County, Tex., to Seminole, Gaines County, 65 miles. For the construction of its line in 1916 and 1917, the Midland Company purchased second-hand rail and other track material and equipment from the Texas & Pacific, offering notes in payment. On March 1, 1920, the road was placed in the hands of the receivers and operation was discontinued on July 17, 1920. On June 5, 1923, the property was sold and was purchased by the Texas & Pacific to protect its notes. The Railroad Commission of Texas in an order dated November 10, 1924, sought to require the Texas & Pacific to rehabilitate and operate the line. The commission states in its decision "It appears, however, that no steps have been taken to force this order; and it is not clear that such a requirement by the state as to a line to be operated in interstate commerce would be valid in view of the provisions of the Interstate Commerce Act."

RIO GRANDE CITY.—*Stock.*—The Interstate Commerce Commission has authorized the issuance of $22,000 worth of common stock.

SOUTHERN PACIFIC.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Central California Traction Company by purchase of its outstanding capital stock and bonds for $2,950,000. The applicant represented that the traction company's line will be useful as a second track between Stockton and Brighton.

STEWARTSTOWN.—*Acquisition.*—The Interstate Commerce Commission has authorized acquisition by the Stewartstown Railroad of the New Park & Fawn Grove Railroad by lease.

ST. LOUIS-SAN FRANCSICO.—*Securities.*—This company has been authorized by the Interstate Commerce Commission to issue $2,699,700 prior lien mortgage bonds, Series D, to be pledged from time to time, until otherwise ordered, as collateral security for notes. Authority has also been granted to subsidiaries of the Frisco to issue promissory notes to be delivered to the parent company in payment for expenditures for additions and betterments as follows: Kansas City, Fort Scott & Memphis, $230,392; Kansas City, Memphis & Birmingham, $225,605; St. Louis, San Francisco & Texas, $32,992; Fort Worth & Rio Grande, $432; Birmingham Belt, $377,759. Action on the request for authority to procure the authentication and delivery of $1,349,880 of adjustment mortgage bonds, Series A, was deferred.

ST. LOUIS-SOUTHWESTERN.—*Examiner Reports Adversely on Acquisition by Rock Island.*—Proposed acquisition by the Chicago, Rock Island & Pacific of control of this company by purchase of its capital stock was not found to be in the public interest at present by C. V. Burnside, assistant director of the Bureau of Finance of the Interstate Commerce Commission, in a tentative report on the Rock Island's application. It appears that the Rock Island and the Cotton Belt already are proceeding to realize the benefits of common control, Director Burnside's report advised, referring particularly to the joint use made of the Cotton Belt's shops at Pine Bluff, Ark., and the instructions issued to their traffic representatives to co-operate in the solicitation of traffic and its routing over their respective lines. The principal reason advanced by Director Burnside for questioning the propriety of the proposed acquisition, however, is that the authority sought cannot be granted without taking into consideration its bearing upon the final consolidation of the railroads, although the Rock Island seeks merely the acquisition of control through purchase of capital stock and not a consolidation *per se*. Under the Commission's tentative plan of consolidation the Cotton Belt is included in System No. 18 with the Frisco. The Rock Island is embraced in System No. 17 with the Southern Pacific. Favorable action upon the Rock Island's proposal therefore would be inconsistent with the Commission's tentative plan, Director Burnside pointed out. He remarked that the Commision has authorized acquisition of control under paragraph 2 of Section 5 of the Interstate Commerce Act in several instances where the resulting relationship of carriers was contrary to the tentative grouping but emphasized that in such cases it has been clearly shown that the public interest was served thereby, and that the authority given was not to be deemed a waiver of the right to make different disposition of the carrier involved in the final consolidation plan.

On the question of public interest, Director Burnside stated that the present record is inadequate as a basis for a satisfactory conclusion and recommended to the Commission that the Rock Island's application should be denied without prejudice to any disposition of the Cotton Belt that may be found at an appropriate time and upon a broader record best to serve the public interest.

VIRGINIAN.—*Equipment Trust.*—The Interstate Commerce Commission has authorized the issuance of $3,600,000 equipment trust certificates, Series E, to be dated July 1, 1925, and maturing in annual installments from 1926 to 1940, inclusive. The equipment trust certificates are to be used for the purpose of acquiring 36 electric locomotives at a cost of approximately $4,815,410. The certificates will be purchased by the National City Company and Lee, Higginson & Company at 97.125, giving an approximate annual yield of 4.96 per cent.

Bonds Sold.—The National City Company, Lee, Higginson & Co., and Kissel, Kinnicutt & Co., have sold $7,500,000 first mortgage 50-year 5 per cent gold bonds, Series A, dated May 1, 1912, due May 1, 1962, at 98 and interest, to yield about 5⅛ per cent. Approval of this issue was recently granted by the Interstate Commerce Commission.

The proceeds from the sale of these bonds will be used in part for future improvements, additions and betterments, and in part to reimburse the company's treasury for capital expenditures already made, largely in connection with its electrification program.

These bonds are securred by direct first mortgage on 504.69 miles of road, extending from Deepwater on Kanawha River, W. Va., through the Pocahontas and New River coal fields, thence east to Sewalls Point on Hampton Roads (at Norfolk, Va.) and on all equipment owned by the company. The bonds are additionally secured by first collateral lien through pledge of all the bonds and capital stock (except directors' shares) of the Virginian Terminal Railway, upon 600 acres of valuable waterfront and the company's two steel coal-loading piers and terminal property at Sewalls Point.

The first mortgage 5 per cent gold bonds, Series "A," including present offering, will be outstanding in the amount of $55,344,000.

Dividends Declared

Canadian Pacific.—Common, 2½ per cent, quarterly; preferred, 2 per cent, semi-annually; both payable October 1 to holders of record September 1.

Consolidated Railroads of Cuba.—Preferred, $1.50, quarterly, payable October 1 to holders of record September 15.

Cuba Railroad.—Common, $1.50, quarterly, payable September 30 to holders of record September 29.

Cripple Creek Central.—Preferred, 1 per cent, payable September 1 to holders of record August 15.

Maine Central.—Preferred, 1¼ per cent, payable September 1 to holders of record August 15.

North Pennsylvania.—2 per cent, quarterly, payable August 25 to holders of record August 18.

Trend of Railway Stock and Bond Prices

	Aug. 11	Last Week	Last Year
Average price of 20 representative railway stocks	84.64	83.63	71.75
Average price of 20 representative railway bonds	90.41	90.03	71.75

Railway Officers

Executive

M. H. McLeod, consulting officer to the executive of the Canadian National, has retired and the position has been abolished.

James Keeley, who has been in charge of the public relations of the Pullman Company, has been appointed assistant to the president, with headquarters at Chicago.

Operating

M. E. Pangle has been appointed assistant general superintendent of the Chicago & North Western, with headquarters at Norfolk, Nebr., succeeding **C. H. Reynolds,** deceased.

Leroy Foster has been appointed assistant superintendent of the Sonora division of the Southern Pacific of Mexico, with headquarters at Empalme, Mexico, succeeding A. D. Handley, resigned.

P. Groome has been appointed acting superintendent of the Central division of the Union Pacific, with headquarters at Marysville, Kan., succeeding **C. E. Hedrix,** who has been granted leave of absence.

W. A. Kingsland, who has been promoted to general manager of the Western region of the Canadian National, with headquarters at Winnipeg, Man., was born on January 5, 1869, at New York, and entered railway service in 1887 as a billing clerk on the Delaware, Lackawanna & Western. He was employed in the office of the auditor of freight accounts of the New York Central at New York in 1889, and in the following year was appointed auditor of the Great Northern Railway of Canada. He served in that capacity with that company and with its successor, the Canadian Northern, until September, 1915, when he was promoted to general superintendent of the lines in Quebec. In November, 1918, Mr. Kingsland was promoted to assistant general manager of the Eastern lines of the Canadian National. He was promoted to general manager of the Eastern lines in December, 1920, and held that position until 1923, when he was appointed assistant general manager of the Eastern region. He continued in that capacity until his recent promotion to general manager of the Western region.

W. A. Kingsland

J. E. Meyers has been appointed trainmaster of the St. Louis and Bagnall districts of the Missouri Pacific in addition to **B. H. Knapp,** trainmaster, who has been assigned to the same territory, effective August 9.

Harley E. Folsom, general superintendent of the second district of the Boston & Maine, has retired at the age of 75 years. **John Rourke,** general superintendent of the First district, has been appointed general superintendent with jurisdiction over the entire system, and **Samuel E. Miller,** superintendent of the Southern division, has been appointed general superintendent of transportation with jurisdiction over the entire system. A number of changes have been made in the divisions into which the railroad is divided. The Worcester, Nashua & Portland division, which has been especially effected by loss of traffic, has been divided between the Southern and Portland divisions. The White Mountains and Passumpsic divisions have been combined, as have the Fitchburg and Berkshire divisions. **Frank H. Flynn,** superintendent of the Fitchburg-Berkshire division, with headquarters at Greenfield, Mass., has been appointed superintendent of the Southern division, with headquarters at Concord, N. H. **John A. Ahearn,** superintendent of the Passumpsic division, with headquarters at Lyndonville, Vt., has succeeded Mr. Flynn at Greenfield. **Frederick C. Mayo,** superintendent of the White Mountains division, has been appointed superintendent of the combined White Mountains-Passumpsic division, with headquarters at Woodsville, N. H. **Benjamin Thomas,** superintendent of the Worcester, Nashua & Portland division, has been attached to the general manager's office, with headquarters at Boston. **W. H. Towne,** superintendent of transportation, will hereafter perform much the same duties with the title of assistant to the general superintendent of transportation.

H. E. Whittenberger, who has retired as general manager of the Grand Trunk Western, was born on November 9, 1862, at Peru, Ind., and entered railway service in February, 1880, as a clerk in the freight office of the Denver, South Park & Pacific. In 1885 he was employed in freight service on the Wabash and two years later was appointed trainmaster on the Grand Trunk at Stratford, Ont. Mr. Whittenberger was appointed superintendent on the Denver & Rio Grande in May, 1902, and held that position until 1905, when he was appointed division superintendent on the Cincinnati, Hamilton & Dayton, now a part of the Baltimore & Ohio. He was appointed superintendent on the Kansas City Southern in July, 1906, but returned to the Grand Trunk in October, 1907, as superintendent at Montreal, Que. He was transferred to Toronto in October, 1912, and was promoted to general superintendent of the Ontario lines in January, 1913. Mr. Whittenberger was transferred to the western lines, with headquarters at Chicago, in May, 1918, and in June of the same year was promoted to general manager, with headquarters at Detroit. During federal control he served as federal manager, returning to the position of general manager in March, 1920. When the Grand Trunk Western lines were consolidated with those of the Central region of the Canadian National, Mr. Whittenberger was appointed manager of the Michigan district of the Central region. In August, 1923, these lines were again separated and he was reappointed general manager of the Grand Trunk Western, with headquarters at Detroit, which position he held until his retirement.

H. E. Whittenberger

Traffic

T. P. Casey has been appointed general agent, freight department, of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, succeeding J. H. Skillen, promoted. **M. H. McEwen** has been appointed general agent, with headquarters at Pittsburgh, Pa., in place of Mr. Casey.

P. H. Yorke, district passenger agent of the Great Northern, with headquarters at Pittsburgh, Pa., has been promoted to general agent, with the same headquarters, a newly created position. **W. E. McCormick** has been appointed general agent, with headquarters at Los Angeles, Cal., this also being a newly created position.

The following men have been appointed general agents of the Missouri Pacific, with headquarters as indicated: **W. E. Babel,** Austin, Tex.; **J. B. Graham,** Baton Rouge, La.; **F. W. Nason,** Beaumont, Tex.; **T. H. Merger,** Corpus Christi, Tex.; **W. C. Ryan,** Laredo, Tex.; **E. H. Buffinton,** New Iberia, La., and **C. E. Wood,** Tyler, Tex. The following have been appointed general agents, freight department: **J. H. Guyot,** Taylor, Tex.; **A. S. Gimble,** Brownsville, Tex.; **E. F. Sada,** Monterrey, Nuevo Leon, Mex.; **E. G. Waring,** Oklahoma City, Okla.

Frederick K. Crosby, assistant general freight agent of the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been promoted to general freight agent with the same headquarters and will have charge of the rate adjustments in the territory east of the Missouri river. **George E. White,** general freight agent, with headquarters in Chicago, will have charge of solicitation and relations with connecting lines in the territory east of the Missouri river, and will also have jurisdiction over off line agencies located in the general freight association and the eastern trunk line territories. **Carl R. Maier** has been appointed assistant general freight agent, with headquarters at Chicago. **Ephraim Rigg,** chief clerk and general freight agent, with headquarters in Kansas City, has been promoted to assistant general freight agent in charge of interstate commerce matters, with headquarters in Chicago.

Robert J. Menzies, who has been appointed assistant traffic manager of the New York Central, with headquarters at New York, was born in Detroit, Mich., on June 17, 1869. He entered railroad service in October, 1882, with the Merchants Despatch Transportation Company at Detroit as a messenger, and served in that capacity and as a clerk until 1887, when he became a clerk in the office of the superintendent of the Lake Shore & Michigan Southern. A few months later he returned to the Merchants Despatch and was promoted to assistant agent five years later. In 1895 he became traveling agent, and in 1905 was appointed agent at Buffalo, N. Y. The following years he was advanced to assistant state agent, with the same headquarters, and a few months later became state agent at New York. In 1907 he was promoted to general eastern agent and in 1909 became general eastern agent of the New York Central Lines. He resigned in 1918 to become manager of traffic of the International Nickel Company, and in 1919 assumed also the duties of foreign sales manager for that company. He resigned this position to accept his recent appointment as assistant traffic manager of the New York Central.

R. J. Menzies

The following changes have been made in the traffic department of the Southern: **Robert H. Hamilton,** district passenger agent at Atlanta, has been transferred to Washington, D. C., in charge of the schedule and time card bureau; **E. E. Barry,** district passenger agent at Houston, has been transferred to Atlanta with the same title; **T. L. Dyer,** chief rate clerk in the Washington general office, has been transferred to Houston as district passenger agent; **B. H. Todd** has been transferred from Louisville, Ky., to Columbia, S. C., as district passenger agent; **T. B. Martin** has been transferred from Pittsburgh, Pa., to Louisville as district passenger agent; **S. H. McLean** has been transferred from Columbia, S. C., to Pittsburgh as district passenger agent; **Carter Chinn,** traveling passenger agent at St. Louis, Mo., has been transferred to the general office at Washington; **H. A. Cline** has been transferred from the general office at Washington to St. Louis as traveling passenger agent.

Mechanical

H. C. Venter, general foreman, locomotive department, of the Southern Pacific, with headquarters at Sacramento, Cal., has been promoted to superintendent of shops, with the same headquarters, succeeding **D. S. Watkins,** who has retired.

V. R. Hasty has been appointed electrical engineer of the Union Pacific, with headquarters at Omaha, Neb., to succeed **E. H. Hagensick,** who has resigned to become representative for the Oliver Electric Company, St. Louis, Mo., and the Pyle National Company, Chicago, with headquarters at St. Paul, Minn.

J. P. Roquemore, superintendent of motive power of the International-Great Northern, with headquarters at Palestine, Tex., has been promoted to mechanical assistant, with headquarters at Houston, Tex., a newly created position. **S. T. Armstrong,** master mechanic of the San Antonio division, with headquarters at San Antonio, Tex., has been promoted to superintendent of motive power, with headquarters at Palestine, in place of Mr. Roquemore.

H. A. Bliss, master mechanic of the Southern division of the Boston & Maine, has been transferred in a similar capacity to the Fitchburg-Berkshire division, with headquarters at East Dearfield, Mass. **W. H. Prindall,** master mechanic of the Connecticut river division, has been transferred to the Southern division, with headquarters at Concord, N. H. The jurisdiction of **D. J. Ayers,** master mechanic of the White Mountains-Passumpsic division, has been extended to include also the Connecticut river division.

Engineering, Maintenance of Way and Signaling

F. H. Bagley, assistant signal engineer of the Chicago Union Station Company, with headquarters at Chicago, has been appointed signal engineer of the Seaboard Air Line, with headquarters at Norfolk, Va.

S. P. Coffin, division engineer of the Boston & Maine, with headquarters at Nashua, N. H., has been appointed division engineer of the Terminal division, with headquarters at Boston. **John J. Rourke,** division engineer of the Terminal division, has been appointed chief of roadway machinery, with the same headquarters. **John P. Canty,** division engineer of the Berkshire division, with headquarters at North Adams, Mass., has been appointed division engineer of the combined Fitchburg-Berkshire division, with headquarters at Greenfield, Mass. **R. H. Park,** division engineer of the Fitchburg division, has been appointed division engineer of the White Mountains-Passumpsic division, with headquarters at Woodsville, N. H. **Frank E. Sampson,** division engineer at St. Johnsbury, Vt., has been transferred in a similar capacity at Springfield, Mass. **Guy H. Watson,** division engineer of the White Mountains division, has been appointed acting division engineer of the Portland division, with headquarters at Salem, Mass., succeeding **George K. Thornton,** who is acting engineer in charge of maintenance of way, with headquarters at Boston.

Purchasing and Stores

F. J. O'Connor, assistant storekeeper on the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., has been promoted to assistant purchasing agent, with headquarters at Chicago, succeeding G. R. Cooke, who has resigned.

IRON ORE MINED in 1924 amounted to 54,267,419 gross tons, a decrease of 22 per cent as compared with 1923.

A WHEAT YIELD of 350,000,000 bushels for Canada in 1925 is forecasted in the second crop report of the Bureau of Statistics.